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A

TREATISE

ON THE

DISEASES OF THE EYE,

AS THEY APPEAR

IN

HINDUSTAN.

BY

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SURGEON ON THE BENGAL ESTABLISHMENT.

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Je sçais que la plûpart des chirurgiens négligent de s'appliquer aux maladies des yeux ; parcequ'elles sont si nombreuses, qu'on s'en fait un monstre, et qu'on croit qu'elles demandent toute l'application d'un homme, et une adresse toute singulière pour exécuter les opérations qui leur conviennent. Il n'est rient de tout cela ; elles sont nombreuses à la vérité, mais elles sont très-faciles à apprendre à un chirurgien déjà éclairé dans la profession : elles n'ont point d'autres règles pour leur traitement, que celles que l'on suit pour guérir les autres maladies ; pourvu seulement que l'on ait égard à la nature de l'oeil : et il n'est besoin que d'une addresse médiocre et d'un peu de jugement, pour en faire les plus difficiles opérations.—*Maitre-Jan, Traité des Maladies de l'œil*, p. 527.

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ADVERTISEMENT.

The following Essay formed the substance of a report which I had the honor to submit to the Government of Bengal in the year 1842, when I officiated as Superintendent of the Eye Infirmary, in Calcutta. That report was intended to afford a description, according to the results of my own experience, of the nature, symptoms, and treatment of the diseases to which the organ of vision is liable, especially in Hindustan; and the object of its publication in the present form is to supply, however inadequately, the want which it is believed still exists, of such a work. A few cases and drawings have been added for practical illustration, and a list of the usual formulæ recommended for diseases of the eye.

Dacca,
20th Jan. 1847.

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PRELIMINARY REMARKS.

THAT beautiful organ, the EYE, which performs such important functions in the animal economy, consists of a variety of tissues which serve to refract the rays of light, as they pass through those transparent media, the cornea and the humours, with their serous envelopes. Objects are depicted on the retina, a nervous expansion spread out on the black surface of the choroid coat, and protected by a dense, strong, external case, formed by the sclerotic coat behind, and in front by the sensitive iris, which proportions the quantity of light admitted, to the capacity of the retina, of which sensation is conveyed to the brain. The eye, as it rests on a soft bed of fat, lining the bony orbit, is moved by a series of muscles, and is connected with the lids by a mucous membrane, or conjunctiva; which, with the eyelashes, and eyebrows, defends the fine structure of the organs from external injuries.

For the proper performance of the functions of this delicate and important organ, certain conditions are indispensable; such as the preservation of the form and consistence of the constituent parts, the unobstructed passage of the rays of light through the transparent media; the maintenance of the healthy

functions of the nervous communication with the brain, and of the muscular organs which direct the motions of the eyes, and the regulation of the quantity of light, which, entering the pupil, impinges upon the nervous retina.

From such a variety of structure, a corresponding variety of disease may be expected; for besides the disorders of the nervous membrane of the conjunctiva, of the serous membrane of the humours, of the tendinous structure of the sclerotica, and the diseases of the nervous, vascular, and other tissues connected with the organ, there are those of the tissues peculiar to the eye, such as the cornea, and humours, and the modified tissues in it, as the retina, the iris, and the choroid tissue. In such a variety of structure, diseases will naturally vary in their symptoms, effects and consequences, affecting more or less the existing sympathy with other organs, and diseases of the body. These causes render the diseases of the eye more or less complicated, and call for a very different plan of treatment in different patients and in different climates, in order to obviate the very serious consequences that would result from following an improper mode of treatment. Less important varieties in the type of the inflammation depend on the function of the tissue affected; on the sex, age, and temperament of the individual; and on the climate and seasons; but a more important distinction is derived from the nature of the cause, and the kind of inflammation thus produced, by which the plan of treatment will require to be modified. Sometimes inflammation is caused by accidents, such as wounds, and external injuries of any

kind. The effect of these causes may be classed under the general head of *Accidental Inflammation.* Another variety of local inflammation is produced by the peculiar state of the system, as in cases of erysipelas, &c., and may be distinguished by the general term *internal,* or *Symptomatic Inflammation.* Under this class may be included the chronic forms of ophthalmia, which are kept up by the state of the system. A third variety is produced by peculiar causes, and is attended with peculiar symptoms. This variety of inflammation is arranged under the head of *Specific Inflammation.* These several types differ so much from each other in their nature, that two of them are not found to co-exist in the same tissue. They also differ from each other in their cause and consequences, and particularly in the treatment required to be pursued.

These distinctions have induced me, in the first part of the following remarks on the diseases of the eye, to adopt the classification just noticed, which will embrace examples of each variety of disease, under its proper head. The different tissues of the eye are more or less liable to be affected by one or other of the varieties of inflammation, which types will be found of great importance in a practical point of view, as each variety requires a peculiar plan of treatment, to be followed from the beginning, and continued to the termination of the disease.

When inflammation of the delicate tissues of the eye is produced by external injuries, the first indication is to remove all external irritating causes, and to diminish their effects by removing blood in moderate quantities, generally, or locally, ac-

cording to the tissue involved, the severity of the symptoms, the stage of the disease, &c., in conjunction with the employment of the usual antiphlogistic remedies. The second, or symptomatic class of causes, requires attention to the state of the system, which often needs to be supported by simple nourishing food, as well as to the means of diminishing the inflammation, and its consequences. This variety of inflammation is liable to become chronic; and much benefit is derived from a careful attention to diet and regimen. It is in this chronic form of disease, that an alterative or mild mercurial course, and local remedies are of so much use: such as fomentations, with a piece of flannel, for five or six minutes at a time; and lotions or drops, or medicated fluids, which may be either astringent, stimulant, or narcotic, and may be applied cold or tepid. As counter-irritants, the liniment of ammonia, tartar emetic plaster, blisters, issues and setons, are used with much advantage in this variety of inflammation. The third variety of inflammation being produced by specific causes, besides following the principles of treatment explained in the two last varieties, requires the administration of remedies of a peculiar nature, which will be described under the head of each disease.

In pursuing this method, I shall first make a few general remarks on each of the varieties of inflammation, followed by a short description of the diseases of the external tissues of the eye, which are most characteristic of each type of inflammation. By this means the distinction between the varieties of the disease will become more evident, while the occasional similarity

in their courses and consequences will be pointed out, and the advantages of following a particular plan of treatment for each variety, will be made apparent. I shall take occasion also to suggest some modifications of practice, and to explain the action of certain remedies now empirically employed. These objects appear to me to be so important as to counterbalance the defects of the proposed arrangement; defects arising from our unavoidable ignorance of the normal, and abnormal condition of the eye. In the present state of our knowledge, such a practical arrangement as has been adopted in the following treatise, will, I trust, be allowed to possess not a few advantages.

The second chapter will contain a description of the diseases of the internal and peculiar tissues of the eye, such as the iris, the choroid coat, &c., in which the symptoms are more complicated, and are less characteristic of inflammation in its different types, than when the external tissues only are affected.

It is at the same time to be understood, that when from the affections and vascular connection of different parts, more than one part is affected by disease, it will be treated of in connection with the texture primarily, and principally affected. Parts at a distance, may, by sympathy, depending on identity of structure, be similarly affected. This is called metastasis of inflammation, and differs from the original disease, according to the functions of the part. For while, in some cases, the inflammation, preternatural irritability, swelling, and pain, appear the same in all, the affection, in the new organ, may be

accompained by the additional symptoms of congestion. In other cases, the cessation of an habitual secretion in one part, gives rise to inflammation in another situation. In all such cases, the characteristic primary disease is that which will be described in the present treatise, and its complicated forms only when they are of sufficient importance to require special notice.

The third and fourth chapters will contain a description of the diseases of the humours, and of the globe, arranged under the heads of Accidental, Symptomatic, and Specific diseases.

The effects of inflammation on the tissues and humours of the eye, will form the fifth chapter; including closure of the pupil, and the different varieties of staphyloma.

The sixth, or last chapter, will contain a description of the diseases of the appendages of the eye, including diseases of the eyelids, and the lachrymal passages, with a few remarks on the operation for removing strabismus.

In the following treatise it is proposed also to notice the different appearances of the diseases of the eye, compared with the same diseases as they prevail in more temperate climates, where a fuller, and more stimulating diet is used, and where the system attains to a more robust condition, as well as the modifications in the treatment which may be, in consequence, necessary. It will be sufficient, in this place, to mention a few of the points of difference, as explaining some peculiarities in the symptoms, and the advantages of the method of treatment which has been recommended.

In tropical climates, the less sensitive and dark skin; the

black eyebrows and eyelashes of the natives, have the effect of deadening the glare of the powerful sun. The size of the pupil of the eye is diminished, by which means the quantity of light admitted into the retina is proportioned to the intensity of the rays, and to the state of sensibility of that delicate organ, the eye, as well as to the state of the retina on which the image of visible objects is depicted. The degree of sensibility of the retina varies with the age of the person. In infancy and youth it is great, but gradually declines to maturity, from which period the diminution of sensibility proceeds more rapidly. It is probably in consequence of this rapid decrease of sensibility in the retina and other appendages of the organ of vision which have been exposed to the powerful sun, that the eyesight fails so early in tropical climates. In addition to exposure to a strong light, the character of the ordinary food of the natives is not sufficiently nourishing for the youth who is increasing in stature, which weakens the system, and produces a debilitating effect on the retina. Such is the influence of these combined causes, that there are not many natives of Bengal who have reached the age of 30 years, who can read a book by candle-light. The weakness of sight is with them greatly aggravated by writing at night with the aid of a dim lamp. In this way a defect of vision often proves the precursor, and lays the foundation of many other diseases. The progress of the complaint is very gradual and is unattended with symptoms of particular severity. It commences with occasional pain in the eye-balls and head, and is attended with some degree of dimness of vision. At

first these symptoms only occur after exposure to the sun, and during the heat of the day, but the defect of vision slowly increases, and manifests itself particularly on the occurrence of any derangement of the system. At length it becomes so great, as to prove a hindrance to the performance of the patient's customary avocations; or terminates in amaurosis, which, if in his power, necessitates an application to the hospital for relief. This is so very common a complaint, that when officiating as Surgeon of the Eye Infirmary at Calcutta, I prepared the following Table, showing the number of applications for impaired vision, and amaurosis, in the year 1841:—

	Total.	Ages.				Total.	Ages.			
	Males.	from 20 to 30	30 to 40	40 to 50	50 to 70	Females.	from 20 to 30	30 to 40	40 to 50	50 to 70
Impaired vision,	81	29	25	17	10	17	4	7	4	2
Amaurosis, partial,	15	6	6	3	0	3	1	1	1	0
Amaurosis, complete,	22	6	7	7	2	7	1	3	3	0
Total,	118	41	35	27	12	27	6	11	8	2

There are serveral points in this Table which deserve notice. In the first place, it will be seen that the number of patients of the male sex is upwards of four times that of females; a circumstance to be attributed to their different occupations, and the greater exposure of the former to the rays of the sun. The number of applicants with impaired vision, was greatest between the ages of 20 and 30; probably from the privations to which they were subject, and which at that period often affect them

more than when the body is debilitated by age. I have seen a whole boat's crew attacked with impaired vision in consequence of their working much and eating little, and being much exposed to the glare of the sun. This effect of privations gradually increases to old age. The greatest number of female patients afflicted with the same malady, were between the ages of 30 and 40, while the paucity of applicants of that, and of every age compared with the males, indicates clearly enough the common cause of the malady; namely, exposure to the sun, which the men in general, from their out-door pursuits, undergo to a much greater extent than the women, whose avocations lie principally within doors. In both males and females the maximum number of cases of complete amaurosis, occurred between the ages of 30 and 50, after which the number of applicants declined. This appears to be owing to the greater rate of mortality amongst persons of advanced age, for a tendency to amaurosis, undoubtedly increases with years; or it may be accounted for by supposing that persons near the middle age feel the importance of resorting to the means of repairing decayed vision, while their families are dependent on their individual exertions for support; whereas those whose great age incapacitates them for labour, depend for the most part on others for the necessaries of life.

The frequent occurrence of cases of impaired vision, does not seem to be caused by a determination of blood alone; for the patient does not in general complain of seeing flashes of light, or muscæ volitanties, and other symptoms of local de-

termination. The disease in general appears to be more allied to paralysis; and seems to be the effect of the glare to which the natives are so much exposed, in the hot and dry atmosphere of most parts of India. The effect, partial at first, and discovering itself by weakness of sight, gradually becomes more marked and intense, and finally terminates in amaurosis, or glaucoma. These most distressing effects are doubtless accelerated by other causes besides exposure to the fierce glare of the sun; such as the excessive indulgence of appetite; the unvaried meal of rice; indigestible vegetable diet; and the habitual use of narcotics and other noxious drugs, which increase the predisposition to this distressing malady.

As so large a proportion of the natives of India depend on their daily labour for subsistence, the loss of sight to them is a serious calamity, exposing them, and often their families too, to the danger of starvation. But though sorrounded with privations, the magnanimity with which they meet distress, is remarkable. Even the loss of vision, the greatest of all privations, is often regarded with the utmost indifference. This absence of feeling is the product of their ignorance. They view the calamity as a decree of fate. The gradual deterioration of the faculty of vision, at which stage the means of relief, if sought, promise to be attended with more certain results, is, if possible, regarded with still greater indifference; and if in any case application is made for assistance, it is deferred till a total loss of sight drives the sufferers to any alternative affording a chance of recovery. Frequently, when interrogated respecting the

duration of the blindness, their answers have indicated either a time long anterior to the date of the application, or some equally indefinite period. On more particular enquiry, the time which has often been assigned, is that when the individual was first unable to eat his dinner without assistance, though this event may have occurred long prior to the time of application for relief. A similar obtuseness of feeling is evinced when the sight has been restored, as for instance, when a cataract has been removed. The patient indeed seems pleased to find that he can see after the operation, but his carelessness soon prevails over every other feeling, for on the removal of the bandages, perhaps on the very next day, when directed to look up, he rarely expresses a high degree of pleasure at being enabled to see so well, but rather seems disappointed that he sees so indifferently. Even when cataracts have been successfully removed, the difficulty, if not impossibility of inducing patients to supply themselves with spectacles, has afforded proof enough how little they valued the recovery of sight. While acknowledging that they saw much better with the aid of spectacles, they remained content with the degree of vision they possessed, imperfect as it was, and preferred dispensing with glasses, unless they were supplied gratuitously; and for the same reason they would be content to remain in a state of blindness, if the operation was likely to cost them money. This observation is applicable not to the poorer classes only, but to the rich, who possess ample means of payment, though they can seldom be induced to lay out their wealth on any objects but those which administer to their pleasures. They will however, be found to

visit the Hospital at some inconvenience in the expectation of obtaining a pair of spectacles as a gift, which they consider necessary for the completion of the good work performed by the Surgeon.

If any apology be necessary for the publication of the following work, the Author trusts that it will be found in the circumstance, that a Treatise on the Diseases of the Eye, adapted to Tropical climates, is yet a desideratum in our medical literature.

The influence of climate on diseases is very considerable, and in the treatment the difference is still wider. This will be understood on perusing the following concise description of the diseases to which the eye is most subject in Tropical climates; the causes most liable to produce them; the best means of preventing them, and the most approved method of treatment for their cure.

The seasons of the year in Hindustan, are not all equally favourable for the performance of these, and other operations; and the difference is so considerable as to merit attention. The extreme hot, cold, or damp months are unfavourable for the purpose, and operations should be deferred till the great heat has been mitigated by the rains, and especially till the genial months of Feburary and March. This is the season recommended by native practitioners; and experience has proved the correctness of their decision. It is, however, proper to avoid the performance of operations even at that season, if diseases, whether in epidemic or other forms, should be found generally to prevail at the time.

EXPLANATION OF THE PLATES.

Plate I.

Fig. 1. Shows the characteristic symptoms of Iritis in one eye, compared with the healthy condition of the other eye.

Fig. 1. (Bis) shows the advanced stage of Iritis, with the pupil completely filled up with coagulable lymph.

Figs. 2 and 3. Examples of the appearance of the eye in Glaucoma.

Fig. 4. Shows the characteristic appearance of a conical Cornea.

Fig. 5. Yielding of the Cornea, and

Fig. 6. Shows the yielding of the Cornea, and the consequent destruction of the eye.

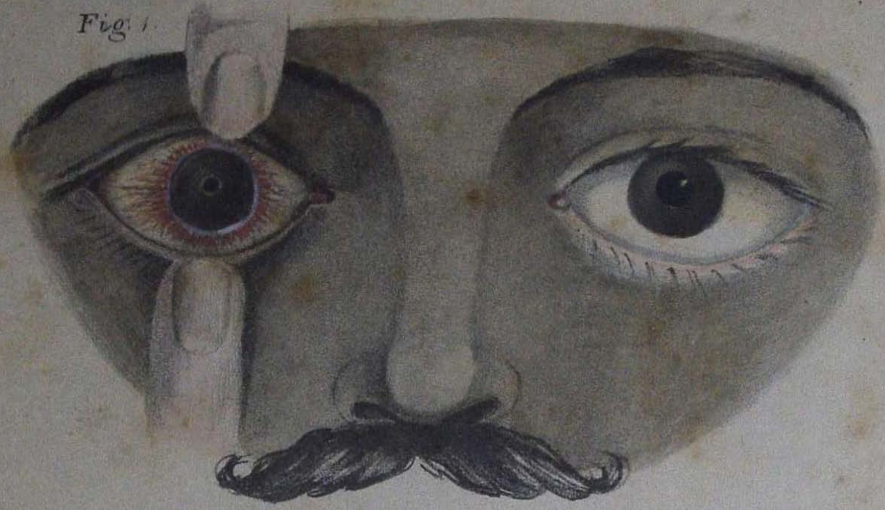
Plate II.

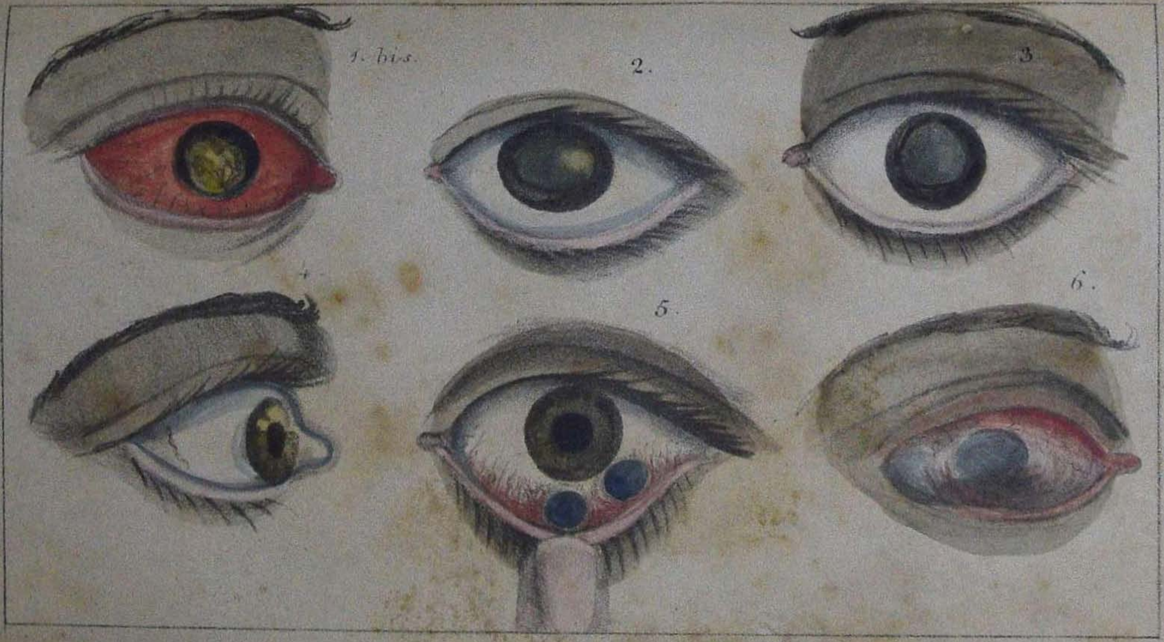
Figs. 1, 2, 3, and 4. Instruments for performing the operation for curing Strabismus.

Figs. 5 and 6. Form of needle recommended for couching.

Fig. 7. This figure represents the appearance of an aggravated form of Purulent Ophthalmia. The upper eyelids are much thickened and closed, while the lower ones are much swollen and everted, with the cornea partly hid and the swelling of the conjunctiva encroaching upon the cornea, which has become dull.

Fig. 1





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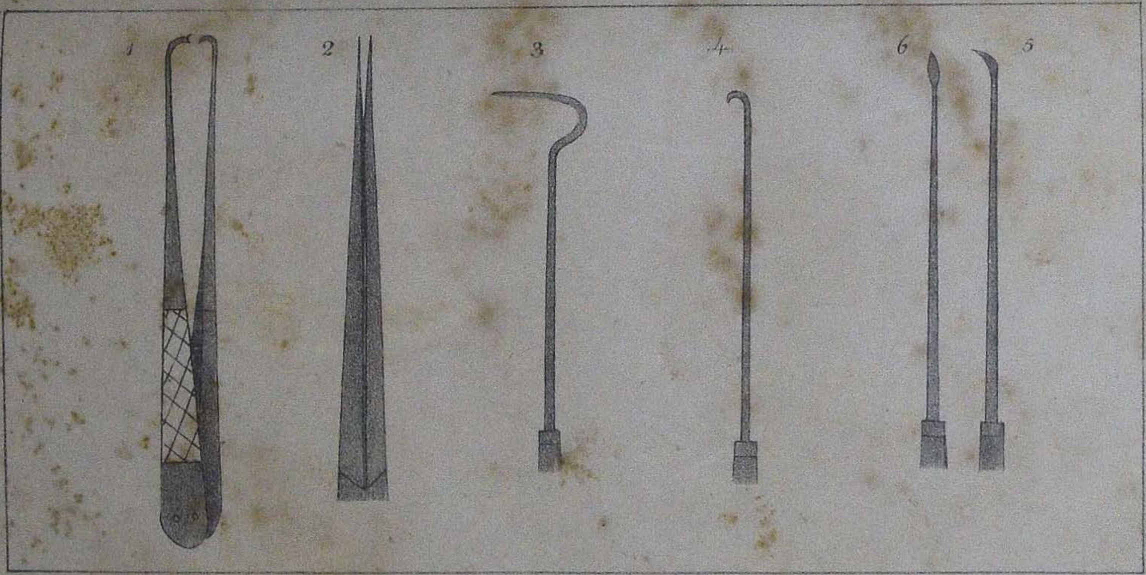
Pl. 2.

Fig. 7.



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A TREATISE

ON

DISEASES OF THE EYE.

CHAPTER I.

Inflammation of the external tissues of the eye.

THESE inflammations will be considered as they are produced by accidental, symptomatic, and specific causes.

SECTION I.

Accidental Inflammation of the external Tunics of the Eye.

Inflammation can always be produced by a certain degree of mechanical or chemical irritation, occasioning an exaltation of the tonic state of the part, and it is as certainly cured by such remedies as will allay the artificial excitement.

This accidental, or as it has been called healthy inflammation, is produced by an evident external cause applied to the part, and affects one or more contiguous tissues at the same time,

rarely extends to any distance, and when severe, it is accompanied with fever.

As the part is not predisposed to inflammation, it has a strong tendency to resolution; or if the cause operates powerfully, to a deposit of lymph, and an adhesion of the surrounding parts, by which the diseased parts, which are liable to suppuration, are separated from the healthy. It is only when the cause acts too powerfully that this order of inflammation terminates in gangrene.

This variety of inflammation of the eye is usually confined to the conjunctiva, in which the arrangement of the blood-vessels is in a *reticular* and *fascicular* form, and is attended with a considerable discharge of hot tears, accompanied by an acute burning yet superficial pain, felt principally during the day time, and the sensation produced is that of sand put between the lids and the eye-ball. External applications suffice to cure this variety of inflammation.

When this species of ophthalmia is severe, or involves a considerable extent of membrane, the heart and vascular system participate in the effects. The patient becomes languid and weak, and complains of chills, which are followed by considerable heat. The surface of the body becomes hot and dry, the respiration is frequent and hurried; the pulse is full, hard, and frequent; the tongue is white and dry, with a considerable degree of thirst, nausea, and sometimes vomiting; the secretions become diminished and depraved, and the organic functions impaired. As the fever advances the patient becomes restless, and complains of head-ache, which sometimes terminates in delirium. These symptoms constitute what is called symptomatic, or inflammatory fever, which declines sometimes

before, in other cases after, the disappearance of the local affection.

The treatment for this order of inflammation is sufficiently simple—consisting of—

1. The removal of all mechanical causes of local irritation, such as light, sand, &c.

2. Cold applications, combined with astringents.

3. Local blood-letting when the inflammation is severe, and general bleeding when the inflammatory fever is high. These evacuations must be repeated according to circumstances.

4. Calomel purgatives, assisted by saline, and diaphoretic laxatives.

5. Counter-irritants, particularly the extracts of the root of the *Amomum anthorhizium* (vulgo *Ruswut*).

6. Rest, spare diet, and water for drink.

In a large majority of cases the inflammation of the eye, from accidental causes, affects more particularly one tissue, from which, however, it may extend to other neighbouring parts. The local affection receives its name from the tissue affected, with the termination *itis*; as conjunctivitis, corneitis, and sclerotitis. This order will be followed in the remarks now to be offered.

I. Ophthalmia, Conjunctivitis, or Accidental Inflammation of the Conjunctiva.

This is one of the most common affections of the eye. It is generally caused by injuries to the conjunctiva, by the introduction of irritating substances between, and under the eyelids; exposure to currents of cold air, to sudden variations of temperature; particularly from intense heat and light, to cold and

damp air, to peculiar states of the atmosphere, &c. The symptoms of this form of ophthalmia are pain, great redness of the conjunctiva, and an increased secretion of hot tears. The external membrane of the eye, and the lining membrane of the eyelids become red, from the vessels which usually carried colourless fluid, now conveying red blood, and being swollen and tortuous. The conjunctiva increases in thickness and the eyelids swell. The secretion of tears is at first copious, thin, and irritating; but as the disease advances it becomes opaque, and consists of a white, or yellowish tenacious mucus, which agglutinates the eyelids together. The pain which is acute and lancinating in the severe cases of ophthalmia, is much increased on the admission of light, and extends to the neighbouring parts. The patient complains of a burning heat, and a sensation as if there were particles of sand between the eyelids. There is intolerance of light, with feverishness, and vision is only affected by the swelling of the eyelids, which are raised with some difficulty. The tears suddenly diminish producing a feeling as if the ball was too large for the socket, and increasing the other painful sensations. The conjunctiva is then of a bright scarlet colour. The swelling appears greatest near the margin of the cornea, and the conjunctiva is sometimes swollen in a circular fold, which is called *chemosis*.

These severe symptoms are accompanied with more or less constitutional effects. There is lassitude and prostration of strength, the patient complains of pain in the back, with chills, followed by feverish heat; when the skin is hot and dry, the pulse quick and hard, tongue white, with nausea and vomiting. The degree of this constitutional effect will vary more with the habit of body of the person, than with the severity of the

local inflammation, so that in young and robust persons, with a high degree of local inflammation, there will often be very little constitutional fever, while in delicate and irritable persons a trifling degree of local inflammation will be accompanied with a high degree of constitutional fever, and the accumulation of mucus.

In mild cases of this form of ophthalmia, after removing all causes of local irritation, a cold astringent lotion of alum, or of the sulphate of zinc, will be sufficient, with an aperient medicine, and refraining from using the eye for some time. In severe cases, when the system participates, the general and local abstraction of blood, cooling lotions, and blisters to the nape of the neck, with purgatives and antimonials are necessary. By such means the inflammation is usually soon subdued, without leaving any inconvenient effects. The diet should be low, and the patient should be kept in a cool dark room, with his head raised, and in a state of rest and quietude.

By these means the severity of the disease declines, the fever disappears, and the symptoms of local inflammation diminish by degrees, and after continuing for some time slowly subside. In these cases the remedies require to be modified. They ought to be more of an astringent nature as the inflammation disappears; and to restore the strength of the part stimulating, and tonic applications will be found necessary; such as the solution of alum in water, or the solution of the sulphate of zinc, sulphate of copper, the liquor plumbi diacitatis, or the vinum opii. For the same purpose the diet should be more generous in this stage, and alterative medicines should be only occasionally used.

Corneitis, or Inflammation of the Cornea.

The cornea is composed of concentric lamellæ, connected with each other by a fine cellular tissue, which is more abundant between the anterior than the posterior lamellæ. In this cellular tissue a fine transparent fluid is secreted and absorbed.

The external surface of the cornea is lined with the transparent conjunctiva, which gives the brilliant polish to the surface; and its internal surface is smooth, being lined with a fine transparent membrane, which is reflected over the iris, and lines the posterior chamber of the aqueous humour. The cornea is joined to the sclerotic coat and neighbouring parts by these lining membranes, and by cellular substance.

The exposed situation of the cornea renders it subject to wounds and injuries from foreign bodies, &c. which are followed by inflammation and its consequences, such as suppuration, and ulceration.

Wounds of the cornea usually heal up by adhesion, without any troublecome inflammation. If extensive, or if the person be very weak, adhesion may not so readily occur, and some stimulating substance requires to be blown upon the surface of the wound to produce this effect.

So common is this want of adhesive power, that extraction of the cataracts can very rarely be performed in Bengal; as it is accompanied with great danger to the organ on account of the wound not healing up, and the eye becoming disorganized. Even the small wounds made in performing the operation of artificial pupil sometimes do not heal until recourse is had to artificial stimuli to the wound. For this purpose I usually employ calomel, with the best effects. It is said, however, in some

cases to form a coating to the lips of the wound, and so to prevent adhesion. I have not seen such a case.

Small particles of a foreign body may strike, or be imbedded in the cornea, and produce inflammation. In such cases the foreign body is soon surrounded by a small opacity the effect of the inflammation. Should this not be attended to, lymph in some cases, after a certain time, is deposited upon its surface and the irritation ceases. In other persons ulceration takes place round the extraneous body, which is washed away with a small slough of the cornea. In all such cases the foreign body should be removed, and the treatment pursued as will be afterward explained.

The first effect of inflammation of the cornea is the loss of the natural lustre of the part, which becomes hazy. In cases following iritis I have seen the whole cornea assume a dull white semi-transparent appearance. Soon after superficial red vessels may be seen passing from the conjunctiva to the cornea. In this state the patient suffers from severe pain, and intolerance of light.

The *treatment* of corneitis consists in following the same directions as are recommended for other inflammatory diseases of the eye. For the removal of all irritating causes, in the first stage, the strict antiphlogistic plan is to be employed, with anodyne, and sudorific medicines. When the acute stage has been subdued, the solution of zinc, of the nitrate of silver, or of the oxymuriate of mercury, is to be applied to the eye. These means require to be continued longer than usual, and varied from time to time, as the disease is not so much under the influence of the circulation as the affection of other tissues of the eye. In some cases I have seen the disease advance under the best directed

means, until calomel was used to affect the system. In such cases this mineral acts most favourably, and may be used in repeated doses, in combination with antimony instead of opium and aperients.

2. *Suppuration.*

Should the inflammation of the cornea continue, lymph and purulent matter are deposited between its lamellæ. These are in some cases deposited in small yellow spots, and in other cases in one point, which sometimes increases slowly so as at length to occupy one third, or one fourth part of the cornea. This appearance is called *onyx* or *unguis*. In some cases this is absorbed, and in other cases the purulent matter is evacuated externally, or into the anterior chamber of the eye, leaving a jagged circumscribed ulcer. When evacuated into the interior chamber it produces *hypopeon*, which is composed of lymph and pus.

When the inflammation of the cornea has been succeeded by suppuration between the lamellæ of the cornea forming the puriform *onyx*, the constitutional treatment must be more strengthening than before, accompanied with the application of blisters, and mild cathartics.

When hypopion forms, the same treatment is to be followed as in the puriform *onyx*. I have found discharging the pus when in considerable quantity from the anterior chamber produce the best effects. In this case the pus is to be discharged by a section of the cornea near its lower margin.

3. *Ulceration of the Cornea.*

These ulcers will be considered under the heads of healthy and inflammatory ulcers.

Healthy ulcers.—These ulcers are produced by slight wounds or other injuries of the eye; which are not attended with much inflammation, or pain. Their edges are of a pale or greyish colour, and there is a gradual diminution of their cavities. This is the means by which nature heals up a breach of continuity; and during the cure of these ulcers, it is only necessary to observe that they are not too much stimulated by light, &c., or the part too much weakened by the local abstraction of blood, by the use of purgatives, or the like, which will impede the salutary influence of nature in healing the ulcer.

Inflammatory ulcer.—This variety of ulcers may arise from the injury being more severe than in the last kind, or from the individual being of a more irritable, or plethoric habit of body. The conjunctival or sclerotic vessels are more or less injected, and vessels are often seen to run over the corneal edge towards the ulcer. There is severe pain in the eye, and over the brow, great intolerance of light, and profuse lachrymation, with feverish symptoms. In these cases the cornea should be examined, and any particle of foreign matter sticking to it should be carefully removed. The patient must then be enjoined not to use the eye, and the treatment should be the same as for acute inflammation of the cornea; and when this has been done a solution of the nitrate of silver, or of the oxymuriate of mercury is to be applied to heal the ulcerated surface.

In other cases the ulceration commences in the interlamellar texture of the cornea, which becomes hazy at the part. This is succeeded by a deposit of matter in the substance of the

cornea, which makes its way outwards and forms a deep inverted conical shaped ulcer, with an ash-coloured irregular surface, to which bundles of red vessels proceed from the conjunctival coat. This inflammation is accompanied with vascularity of the cornea, much pain, a copious flow of tears, great intolerance of light, and inflammation of the conjunctiva. The patient often feels a most painful sensation as of a foreign body within the lids, as they are moved upon the globe. In these cases the pain is often spasmodic. This is the form of ulcer which, when not properly treated, penetrates into the anterior chamber by which the aqueous humour escapes, followed by a portion of the iris. This adheres to the ulcerated edges, and forms a small black point. When the ulcer, and protrusion of the iris is small, it is to be touched with a fine pointed caustic pencil.

The cornea, after ophthalmia, is sometimes left with a diffused cloudiness of the whole or of a part, without any distinct boundary. In this variety the opacity is superficial, and in its centre, and diminishes towards its circumference until lost in the transparent part of the cornea. It is never so great as to conceal the pupil, and vision is only rendered less clear and distinct. Sometimes the conjunctival lining, and one or more superficial layers of the cornea slough, and leave an opacity with a rugged edge, beyond which the cornea remains whole and transparent. These varieties of opacity are called *nebula*. When more circumscribed and white, and confined to the cellular tissue of the cornea, or when produced by the effusion of opaque matter between the cornea and the conjunctiva it is called *leucoma;* when deep seated it assumes a polished surface, and when more superficial it is duller, with a nebulous appearance around the

opacity. The deep-seated pearly opacity obstructs the rays of light, and when large, and near the centre of the cornea is incurable, and the person will remain permanently blind, unless an artificial pupil can be formed.

The cicatrices of deep ulcers or wounds, when healed, leave an opacity, called *albugo;* and being impervious to light, when large and near the centre of the cornea, it destroys vision. This form of opacity is either produced by a thickened and condensed opacity of the layers of the cornea, which are firmly united with each other or the conjunctiva, producing the dense pearly white appearance. The iris is, in other cases, united with the cornea at the edge of the albugo, which distorts the pupil.

The treatment of ulcers of the cornea should consist in diminishing inflammation by removing all irritating causes, and by employing the usual antiphlogistic remedies. This state of irritation is known by the presence of pain, and the sense of warmth in the tears. When the acute inflammation has been removed, or much diminished, when there is little pain and the tears feel cold to the patient, the ulcer is to be touched with a fine pointed caustic pencil, or a solution of the nitrate of silver, or sulphate of zinc, should be applied to the ulcer, to increase arterial action, and consequently absorption. The solution is to be increased in strength so as to produce when applied a slight degree of momentary irritation in the part which is followed by a soothing feeling. In the more chronic forms of ulcers the occasional application of leeches and calomel, to promote absorption of the newly deposited matter; blisters with mild sedatives and cathartics, such as rhubarb, aloes, and tonics will be found of use, with pure air, and nourishing food.

The nebulous opacities of the cornea, when recent, may be removed by the use of stimulants, so as to excite a temporary vascular action, which is followed by a corresponding excitement of the absorbents. *Leucoma* may be removed by these means in the young, and when recent. I have seen the same plan of treatment of great use when considerable portions of the external lamillæ have sloughed, leaving a grey semi-transparent appearance at the part. In such cases the use of the solution of the nitrate of silver, with attention to the general health, has cleared the cornea, and restored the eye to a useful state of vision.

When the structure of the cornea has been changed, and the interstitial structure obliterated, forming albugo; or when the same change has been produced by cicatrices, the stimulating plan will not be of much use. Such cases may be considered incurable, still the surrounding nebulous opacity may be removed, and vision improved by the stimulating plan of treatment; but it is necessary to be very careful of the time, and frequency of their use. If employed before any inflammation that may be present is sufficiently removed, it will increase the inflammation, and its consequences. The decision of this point is of great practical importance, and the best indication is afforded by the degree of redness, and of pain, and the temperature which the tears convey to the patient's feeling. When there is a diminution of redness and pain of the neighbouring parts, with cold tears, the stimulating lotions may be used with the best effects. For this purpose the solution of zinc, or of the nitrate of silver, in the proportion of two grains to an ounce of water, will be found of the greatest advantage. The application should be followed by a slight degree of uneasiness, or pain,

on their application; which, however, quickly goes off, and is succeeded by a soothing and cooling sensation.

Case of Interstitial ulcer of the cornea.—Luchmee, aged 40, was admitted into the eye infirmary on the 23d October, with an ulceration of both corneæ. The ulcer of the right cornea had extended over its whole surface, which was reduced to a yellow pulp, with an inflamed conjunctiva.

A third of the left eye was also ulcerated. It had commenced as a small white spot surrounded by an ulceration, which had enlarged rapidly. At the time spoken of, it was of a yellow colour, from the purulent matter contained between the layers of the cornea. The patient, when admitted into Hospital, complained of pain in the eye and head, which increased so much towards the evening as to prevent sleep. A calomel purge was administered, and leeches, with the oxymuriate solution were applied to both eyes. This was followed by the application of a blister with a dose of calomel, opium, and hyosciamus.

25th.—The inflammation was diminishing, while the ulceration of the left eye was rather increased, and the cornea was half obscured by the ulcer. The pain had left the eye and head, and he slept well. The solution of the oxymuriate was found too strong, and the nitrate of silver drops were substituted. The ulcer still continued to extend, and a bark or tonic mixture was administered.

29th.—The ulcer is now diminished in size, and is clean.

The patient complained of pain in the temple. A blister was applied below the ear, and a calomel purge was exhibited.

Nov. 1st.—The mouth sore, and the ulcer diminishing rapidly, and by the 5th it was nearly healed. This treatment

was continued, and the ulcer was cured, leaving only a slight opacity of the cornea.

The right eye, under the influence of the nitrate of silver solution soon cleaned away leaving the iris with the pupil contracted, and filled with lymph. The inflammation gradually increased from a staphylomatous swelling which formed, and by the motion of the lids kept the eye in a state of irritation. The swelling was removed, the lense, and a portion of the vitreous humour were evacuated. This patient was discharged with a serviceable left eye.

Sclerotitis.

The sclerotic coat is a white, brilliant, very elastic, solid, and fibrous membrane, which may be forcibly separated into several layers. These are united to each other by intermediate filaments. The external and internal surfaces of the sclerotic are smooth, and it is perforated by different vessels, which penetrate, and pass to its anterior border. The inflammation of the external tunics of the eye seldom passes into the internal tunics, in consequence of the interposition of this dense texture, and the little vascularity between the conjunctiva and the choroid coat. It is for the same reason that the primary sclerotitis is a rare disease; and it almost invariably accompanies diseases of the iris and cornea from their more intimate connection with it, by means of blood-vessels, &c. It is also at the anterior border of the sclerotica that the annulus ciliaris adheres closely to the sclerotic, and when distended by blood forms the vascular zone at the margin of the cornea.

The inflammation of the sclerotica may be produced by a state of inflammation of the conjunctiva, but it more frequently

arises from an inflammation of the cornea, or iris. The vessels in sclerotitis have a straight course to the margin of the cornea, and the disease is very obstinate. The pain in the eyeball is dull, and its motions are painful. The inflammation generally extends to the cornea, which becomes nebulous, and, from the effusion of lymph beneath its conjunctival covering, its surface becomes rough.

Sclerotitis sometimes accompanies, and is vicarious with rheumatic inflammation of other parts of the body. This is easily understood from the similarity of the tissues affected in these diseases. In other cases this disease accompanies attacks of gonorrhœa, and some eruptions, especially of the pseudo-syphilitic character. In this variety of ophthalmia the peculiar features are the zomelar arrangement of the vessels, the nebulous change in the cornea, the more or less cloudiness of the aqueous humour, and the pupil often drawn to one side.

Sclerotitis is less under the influence of medicine than the generality of the diseases of the eye. The pain of the eyeball will be diminished by blood-letting and the exhibition of antimony, and ipecacuanha with opiates. The action of mercury is less marked in this disease, and it is more liable to relapses, and occurs more generally in irritable persons who have suffered much from rheumatic diseases, more particularly that kind which is produced by exposure to cold while under the influence of mercury. Still great advantage will be obtained by the judicious exhibition of mercury, with nitric acid. In other cases the use of Plummer's pill, the hyd. cum cretâ; the oxymuriate of mercury in doses of 1-8th or 1-16th part of a grain well be found serviceable. With these, Dover's powder, hemlock, and hyoscyamus, and the extract of sarsaparilla, with the

decoction, or infusion of bark, and cheyreta, with ammonia, colchicum, &c. These remedies will all be found particularly useful in the chronic cases of this disease.

Section II.

Ophthalmia Symptomatica.

This order of ophthalmia is not produced by an external, evident irritating cause, but by internal and often obscure causes, such as the derangement of the stomach, the depraved or irregular action of certain vessels, the influence of climate, &c. Such inflammations are preceded by more or less symptomatic fever, which is of a low irritable nature, and is subject to remissions, and nocturnal exacerbations.

In this form of inflammatión the redness is less intense, and is more livid and uniform than in the accidental ophthalmia; and the vessels are arranged in a *reticular* and *fascicular* form. The secretion is considerable and fluid, the pain is less severe, and of a burning nature; and increases at noon, and during the earlier part of the night. The heat is also less intense; and the swelling less prominent than in the first order of inflammation.

The derangement of the system is usually great, and the fever generally precedes the manifestation of the local disease, and continues after its disappearance; it is likewise more of a low irritable nature, than that attending the first order of inflammation.

This symptomatic fever is produced by more complicated causes than the first or accidental fever; such as of violent exercise, exposure to such a degree of cold as arrests suddenly

the perspiration, malaria, followed by fever. This form of fever is usually preceded by a cold stage from an unusual distribution of blood, which produces languor, anxiety, and debility; the limbs totter, the skin is cold, pale, clammy, and shrivelled; the features appear shrunk, the eyes lose their animation, and the secretions are diminished in quantity, and changed in quality; those of the mouth, afford a criterion for determining the nature and degree of the disease. When a crust of white mucus covers the dry tongue, it denotes a strong action of the vessels, and when it becomes more or less brown it indicates an atonic state of the system. After these symptoms have continued for some time, a state of re-action follows in which the pulse is strong, full, quick, and bounding; the skin hot, with a throbbing pain in the temples, or a dull pain across the forehead and back. The eyes appear red, and sparkling, and there is an intolerance of light and sound. The patient has frequent deep respirations, with an insatiable thirst, an irritable stomach, and a loathing of food. His bowels are irritable, the urine red and scanty, and deposits towards the termination of the disease a large quantity of a brownish sediment.

When the fever is severe the pulse becomes smaller and more frequent, the tongue dry and brown in the middle, accompanied with great prostration of strength, coldness, restlessness, and want of sleep, terminating in some cases in delirium. The paroxysms of this fever increase at mid-day, and towards night. It is produced either by local congestions or inflammation of the organs, as seems to be proved by the symptoms, and by the increased size of the cruor of the blood.

It usually attacks the weak and unhealthy, rather than the strong; affects one tissue of the eye, often spreads, and not

unfrequently passes from one eye, or part of the body to another.

A peculiar connection or sympathy between the parts and analogous textures, appears to produce this change in the locality of the disease. This sympathetic action deserves careful consideration, as it becomes more marked when the parts are exaggerated by disease, and it often enables us to find out the best means of preventing and curing this class of diseases.

The stomach has the most extensive sympathy with all parts of the body. The general wants of the system, by occasioning the sensation of hunger, cause the person to become sullen and silent; but a crust of bread or a glass of wine will produce cheerfulness, even before the nourishment has had time to reach the general circulating system. The fatal effects, suddenly produced, by a blow upon the stomach, or a draft of cold water when the body is heated, prove the importance of this organ to the system.

When a part is hurt it affects the stomach more or less according to the severity of the injury, the importance of the part injured, &c. In irritation of the kidneys, the pain and vomiting are sometimes so great, as to lead an inattentive observer, to suppose that the disease was gastritis. This influence extends to mental emotions, as is proved by the effects of good or bad news upon the appetite.

The intimate sympathy between the vital energies of the brain and the stomach, the whole cutaneous circulation, and other parts of the body, furnish further examples of mutual connection. As the view of suffering in another leads us to endeavour to alleviate it; in like manner the body sympathises more or less with local disease according to the importance or

sensibility of the part. The derangements of the biliary secretion produce lowness of spirits: sympathetic fever and locked-jaw are produced by local injuries; chorea sancta viti is generally produced by disordered secretions of the abdominal viscera, and epilepsy is often caused by worms in the intestines.

All the functions of organs have a sympathy with each other but this varies in different organs and individuals. In one person it is the brain, in another digestion, &c., which preponderates, according to the greater or less activity of the organ in health or when affected by disease; when the most obscure sympathies become apparent. As the general sympathy may affect a particular part, and the general system frequently sympathises with the local organ, any one of the organs may thus become the cause of a general irritation of the system. The genital organs, and the functions of the brain, are familiar examples of such sympathies; while in fevers, they vary according to the nature of the disease, and the organization of the part.

The different tissues which enter into the composition of organs are affected by their peculiar irritants, performing their peculiar functions. The different senses, &c. afford examples of such sympathies. The approximation of aliment to a hungry person increases the flow of saliva; the irritation of light acts on the retina so as to regulate its quantity for producing vision; the pregnant uterus is accompanied with an enlargement of the mammæ, &c.

Hunter has called that sympathy continuous, in which the neighbouring parts sympathise with local injuries. The reciprocal relations of the different parts of the digestive organs

affords an example, as is observed in the good or bad taste of food, which prepares the stomach to receive, or to reject it. The irritation at the orifice of an excretory duct increases the action of the gland; worms in the intestines produce irritation of the nose; as a calculus in the bladder does to the irritation at the extremity of the urethra.

Analogous structure and functions have an intimate relation to each other; thus when one part, as the eye, is inflamed, the other organ is very liable to be affected. When rheumatism attacks one joint it is liable to affect others.

These remarks on the different sympathies will prepare us for the peculiarities in the course of some of the species of this order of inflammation.

Whatever has a tendency to disorder the general powers of the system, so as to produce a certain degree of permanent weakness, or change in the vitality of the part, has a tendency to produce symptomatic inflammation. Such as bad food, intemperance in drink, impure air, hot, and unhealthy climates, severe exertion, mental depression, evacuations, &c. In this manner the eyes, lungs, &c., are inflamed by the local debility of the nerves supplying these parts, and sedatives applied to parts weak and easily deranged may have the same effect. The exposure of the extremities of the body, to severe cold, is succeeded by a powerful re-action, which sometimes terminates in the consolidation of the blood, and inflammation.

Another cause of symptomatic ophthalmia, is a local determination of blood, the sequence of previous attacks of inflammation in the part, which has always a tendency to extend itself, as the blood becomes affected in the analogous tissues, or parts previously diseased. In some this cause operates more

powerfully, or on certain organs more than on others; as heat affects the liver and bowels, sudden exposure to cold, particularly when combined with moisture, affects the air passages, &c. The tissues most liable to be thus sympathetically affected, are first the serous sacs on the same side as that affected; and secondly, the serous sacs of the opposite side of the body. The brain and spinal marrow; the alimentary canal; the lungs, heart, and skin are likewise liable to be thus sympathetically affected, in the order in which they are mentioned.

Other causes of this form of inflammation act at a distance from the part affected, as cold of the feet producing inflammation in the throat, &c. When the body is perspiring, or when there is an unusual determination of blood to the surface, a sudden application of cold is apt to produce internal inflammation.

Mental emotions powerfully affect capillary vessels producing local congestions, as in blushing, in the secretion of tears, &c. Sometimes the influence of the nervous system upon the circulating fluid may be so considerable as to produce disease. In such cases the first effect is on the tissue of the vessel, and then upon its contents; and it may be so weak as only to change locally the balance of the circulation. The degree of the effect will depend upon the sensibility of the part, and shews itself when severe by the local increased action. The heat, sensibility, and irritability of the part, are increased, and the quality, and the quantity of the blood are changed; and like the secretions are more copious and consistent. In this state the part possesses more vitality.

The occurrences of such changes will be more readily allowed when the influence of the nerves upon the vessels, and their

contents is considered. Dupuytren found that the division of the eighth pair of nerves prevented venous blood being changed into arterial, and Dupuy found the arterial blood drawn from the carotid artery deprived of a portion of its fibrine, producing a dissolved state of the blood, and when such blood was injected into the veins of another animal, as a horse for instance, it produced gangrene. By the division of certain nerves the organ they supply inflames. Magendie has proved this in the case of the fifth and eighth pair of nerves, which when divided produced inflammation in the eye and lungs.

Parts situated at a distance from the heart, those in which the venous blood returns against its own gravity, heal more slowly than parts in opposite circumstances; and long courses of mercury or weakness of any kind leave a tendency to ulceration. In this manner ulcers frequently form in scurvy, particularly in the cicatrices of former wounds. It is a similar weakness which inflammation produces in the parts affected by it.

Symptomatic inflammation rarely attacks two parts, at the same time near each other, but a part in the neighbourhood may acquire a greater susceptibility than the part affected, and there is a sudden suspension of the disease in one part, and a development in other parts, particularly in analogous tissues, and organs holding a relation of dependence upon each other. This is called metastasis. Such translations are most common in the form of congestions; in other cases it is in the form of inflammation, and other morbid actions. In these cases the nature of the disease remains the same; as we find that it will return to the original seat on an irritating substance being applied to it, which causes it to leave the part secondarily affected.

The sudden translation of exanthematous diseases is an example of metastasis. During the time of transference there is often, says Dr. Holland, a well marked disturbance of the heart, of the nervous systems, and of various organs seemingly out of the ordinary course of disease, which appear when the symptoms are again locally fixed.*

In other cases the translation forms what is termed a critical termination of the disease, in which the inflammatory symptoms are often very slight, and a most peculiar secretion into the part is the most marked effect. Thus in phlebitis there is often found a deposit of pus in the synovial sacs; and in one case, I found on dissection numerous deposits of pus in the substance of the liver, after inflammation of the synovial membrane of the knee-joint, caused by opening it in order to extract a cartilage. In other cases dropsical effusions are sometimes rapidly translated from one part of the body to another; and as this sometimes takes place to the head it may prove rapidly fatal.

This order of inflammation may be divided into the acute and chronic varieties, and sometimes terminates by resolution. The chronic form of symptomatic ophthalmia is of frequent occurrence, and of great practical importance. It usually takes place in persons who have had their bodies debilitated by long continued disease, by living on unhealthy food, in an unhealthy climate, and by the improper use of certain medicines. The medicine which produces such an effect, is calomel, particularly when the patient suddenly exposes himself to cold and damp, when under its influence.

Most chronic diseases are produced or kept up by a bad habit of body; by which a fulness of blood is produced, fol-

* Med. Notes, p. 540.

lowed by a diminution of its motion. Intemperate and inactive habits enlarge the liver, derange the whole system, and render the person susceptible of disease; which may be experienced in different parts and tissues of the body at the same time.

When inflammation has occurred in a part, it leaves it in a state of weakness, from the capillary branches having been unusually distended, and slowly regaining their natural dimensions and tone. On this account the curative means must be kept up, and the exciting causes avoided, so as to prevent its recurrence for some time after the symptoms of inflammation have disappeared.

Besides the acute and chronic varieties of this type of inflammation there are others, which vary with the tissues affected. These may be considered, first, as affecting the integuments, cellular, fibrous, or nervous tissues; the organs of sense, and the parenchyma of organs, and secondly, according to the general effects upon the system, in producing conjestive, and inflammatory forms of fever; which may, under particular circumstances, spread by contagion.

The treatment of the symptomatic order of inflammation differs from that of the accidental. In the first form the exciting causes are first to be removed, and then their consequences. These indications point out the danger of evacuations in many cases; and the importance of removing the irritating causes. As the affection is very frequently constitutional, the state of the digestive organs, and the general health should be carefully attended to.

Our first indication is therefore to remove the constitutional derangements by which the disease is kept up. Emetics will be of use in removing undigested food and bile, with purgatives,

tonics, and nourishing diet. Sulphuric ether in small doses, and antimony with camphor or nitre, will be found useful when repeatedly exhibited with calomel or rhubarb, as the case may indicate.

Local remedies are much less needed than in the treatment of the first order. In symptomatic inflammations the topical treatment should be directed to the removal of any local cause of irritation, either by absorbing the irritating morbid matter, which is often secreted from the inflamed surface, or by the employment of fomentations, anodynes, and antispasmodics. In some cases topical bleeding will be of use by removing the local congestion of blood, which often keeps up the disease, in others these evacuations will prove injurious by increasing the weakness of the part.

A gentleman who had been many years in this country consulted me for a sudden and very severe pain in the left side of the head and in the globe of the eye, caused by exposure to a cold and damp air. When I saw him the side of the face and the conjunctiva on the same side were swollen and red; there was great intolerance of light, &c., and he complained of severe intermitting pain in the same side of the head, but particularly in the globe of the eye. In this case warm soothing lotions to the eye, with quinine and aperients speedily removed all the distressing symptoms. This intermittent inflammation, or rather congestion, I have seen affect the eye in a more chronic form when a treatment with tonics and anodynes proved very efficacious, proper attention being at the same time paid to diet, and all the irritating causes avoided.

These attacks occur in persons whose general constitution has been weaknened by a residence in an unhealthy climate, one

characteristic of which is a feeble digestion. In such cases the patient is subject to violent and long continued paroxysms of pain, often confined to one spot in the head. The plan of treatment abovementioned is of great use in relieving the symptoms, but change of air to a better climate is sometimes found necessary.

After the above general remarks on this order of Ophthalmia of the different external tissues of the eye, it is here only necessary to remark that the vessels of the inflamed part are left in so weak a state that a chronic form of inflammation is often the consequence, requiring a change in the system of treatment. Instead of persevering in the use of the antiphlogistic remedies an opposite plan requires to be followed. Tonic and astringent applications are now to be employed. At the same time attention should be paid to the state of the stomach and bowels; as in many instances the local affection may cause a general derangement of the system, which requires to be removed before the disease can be subdued.

As the symptoms, although somewhat modified by the tissue affected, and the treatment to be followed in each case are alike, I shall first make a few remarks on chronic and acute symptomatic ophthalmia of the conjunctiva, and of chronic corneitis, and iritis, and then notice the principles of the treatment to be followed in these varied types of the disease.

A. *Chronic Inflammation of the Conjunctiva.*

This usually occurs after an acute attack of inflammation; but there is another and very important form of this disease characterized by atony or debility, and consequently requiring even from the commencement a totally different plan of treatment from the acute form of ophthalmia. This distinction

is so important that serious consequences may follow an incorrect diagnosis, while to form an accurate judgment is difficult, as the symptoms often vary in degree rather than in kind. The redness, the chemosis, and the swelling are less intense in the chronic state, the pain which accompanies it less acute, the intolerance of light and the effusion of tears slighter, and there is very little constitutional disturbance. Most cases of chronic inflammation follow an attack of acute ophthalmia, which is kept up, in a diminished degree, by the state of the system, particularly of the digestive organs. Similar effects are produced by slight irritating causes to the eye, such as exposure to a current of cold and damp air, to acrid fumes, or smoke; and they sometimes occur in the course of certain diseases, such as measles, small-pox, dentition, frequent intoxication, &c.

The treatment of this variety of inflammation often proves difficult and tedious. A correct treatment is of the utmost importance, as the inflammation may extend to internal and important tissues, and may be followed by disorganization of the structure of the eye, and the irretrievable loss of sight. The disease may also pass on to effusion, adhesion, suppuration, ulceration, and gangrene.

An *effusion* of serum or blood under the conjunctiva may take place from neglected chronic inflammation. In these cases the redness is usually round the cornea. A much more common cause of the effusion of blood is from violent exertion, as from coughing. Weak native children are often so affected during the prevalence of epidemic hooping cough. In these cases the effusion often nearly covers the whole of the anterior part of the sclerotic coat. In these cases the effused blood is soon absorbed without the application of any remedy.

Adhesion. Another effect of chronic inflammation is a secretion of opaque matter between the conjunctiva, and the transparent cornea. The extent and quantity of this secretion is liable to variation. Sometimes it forms a simple cloudiness when it is called *nebula;* or the opacity may be more complete and of considerable size, when it is called *albugo,* or *leucoma.* I have already considered these opacities under the head of accidental corneitis.

Chronic inflammation of the conjunctiva may also terminate in *suppuration* or in *ulceration.* This termination usually occurs in the cornea, when the ulcer is sometimes superficial, but at other times it may be deep, with a transparent surface, becoming opaque and white when healing.

Sloughing or mortification, may be produced in weakly subjects by chronic inflammation, though such a termination is rare, and is usually to be ascribed to great mismanagement.

The *treatment* of *chronic* inflammation of the conjunctiva should consist:

1*st.*—In living on nourishing and easily digested food.

2*d.*—In the occasional use of aperient and alterative medicines to evacuate the bowels, and to promote their healthy action, followed by the exhibition of tonic medicines.

3*d.*—The local remedies should consist of moderately astringent and stimulating collyria, so as to excite a degree of action in the vessels of the part. Of these the alum, zinc, and copper solutions; or the liquor acetatis plumbi, or vinum opii, may be used, at first diluted, and gradually increased in strength, according to the action on the diseased part. The criteria observed by which the use of these stimuli and their continuance are to be regulated, are first, that the patient feels

the eye or tears sensibly cooler; and secondly, that the application produces a degree of smarting or pain, which soon subsides, and leaves the patient more easy than before. If the pain is greater, or does not subside speedily, and the vessels become turgid, the strength of the stimulus should be diminished, as when such effects are produced, it is doing harm. Blisters and other counter-irritants are of great use; and a shade should be worn over the eyes.

As indicative of a tonic state of the system, and morbid state of the part, I shall under this head treat of *encanthis* and *pterygium*.

Encanthis.

In this disease there is an enlargement of the caruncula lachrymalis, and semilunar fold of the conjunctiva. This swelling, as it increases, is granular at first, then becomes more dense and smooth, and often attains the size of a hazel nut, with large vessels ramifying upon its surface, is of a light yellowish colour. As the tumour enlarges, it prevents the lids from closing, the eye becomes weak and irritable, and the tears flow over the cheek, from the puncta lachrymaria and ducts being pushed out of their place. It sometimes assumes a malignant nature, and may terminate in the patient's death.

The object in the treatment to be pursued is to remove the swelling. This is best done by an assistant separating the lids, while the operator seizes the tumour with a forceps, and removes it with a pair of curved scissors.

Case. Gobind Gwala, æt. 32, was admitted into the Hospital on the 21st August, with an ulcerated encanthis of several months' standing, of the size of a small pullet's egg, of an

irregular, hard, granular appearance, with a deep foul ulcer near its centre. It extended under the eyelids, and into the orbit, so as to push the ball of the eye upwards and outwards. There was also a considerable enlargement of the parotid and submaxillary glands. As these swellings were indolent, and the Encanthis increased while the patient was under the influence of iodine and aperients, I removed the cancerous tumor. The extirpation was accomplished without much difficulty. The humour extended deep into the orbit, but care was taken that the whole morbid mass should be removed. Only one artery required the ligature. Vision was restored.

Pterygium.

This is the name given to the triangular membrane, which grows from the internal angle of the eye, and gradually extends over the cornea, often impeding, and eventually destroying vision. In some cases it proceeds from the external canthus, and more rarely from the inferior or upper half of the hemisphere of the eye-ball. In a large proportion of cases the disease arises from the inner canthus. In most instances the apex of the triangle is pointed; though it sometimes assumes a semi-circular form of considerable size. Two varieties of Pterygium have been distinguished; the first which is formed of a thin, loose web-like film of a pale colour, is called *membranous*; the second is denominated *fleshy Pterygium.* In the latter form the structure of the membrane is thicker and denser, being more vascular than in the other variety. In both forms the vessels proceed from the base towards the apex of the triangle.

The object of the treatment should be to remove the triangular partition by excision. This is done by raising the membrane

either with a hook or forceps, and dividing it midway between its base and the cornea. Care is required to remove the whole portion next the cornea, and even when this is done the free application of caustic is necessary to clear the cornea, and to prevent the deformity which is likely to arise from the adhesions which take place between the lid and the remnants of the membrane.

B. *Acute Symptomatic Inflammation of the Conjunctiva.*

The acute forms of symptomatic inflammation of the conjunctiva are erysipelatous inflammation, and catarrhal, purulent, and gonorrhœal ophthalmia. In treating of these forms of disease I shall subjoin a few remarks on the purulent ophthalmia of infants, as it appears sporadically, and in an epidemic form.

1. *Erysipelatous Ophthalmia.*

This is a symptomatic disease, commencing with a feeling of tension in the eye and surrounding parts, and is attended with rigors followed by head-ache and fever. The conjunctiva becomes of a pale red colour with a tinge of yellow, and soft moveable vessels form round the cornea. The eye is very sensible to light; and the redness becomes more livid, appearing in irregular spots of different sizes. In some sparts these pots have a bright red colour, from the extravasation of blood into the cellular tissue between the conjunctiva and the sclerotica. The vessels increase in size, and between them and the fold of the conjunctiva thin white mucus is found, while the discharge of tears is increased. The cornea appears dim, and the lids adhere together in the morning, from the increased morbid mucus secretion. As the symptoms decline this secretion diminishes and

becomes of the natural quality, the redness of the conjunctiva and the secretion of tears likewise decrease; the vesicles disappear, leaving red spots of extravasated blood, which becoming gradually of a yellowish colour, disappear in their turn. The connection between the conjunctiva and the sclerotic coat continues though in a slight degree, so that the latter membrane forms wrinkles on the eye being moved, and it is often a very considerable time before the conjunctiva returns to its natural state.

This species of ophthalmia is generally brought on by exposure to sudden changes of temperature, particularly from heat to cold, and moist air, as well as by such causes as produce erysipelas in other parts of the body. The disease often occurs simultaneously with erysipelas of the neighbouring parts, but in some cases it attacks the eye alone.

The *treatment* should consist in attention to the stomach and intestines, with leeches to the eye-lids when the inflammation is severe; the use of warm fomentations, followed by stimulating collyria; and exciting the cutaneous system, by gentle diaphoretics followed by tonics. The vesicles should be opened with a lancet as they form.

2. *Catarrhal Ophthalmia; or Ophthalmia Tarsi.*

This disease is principally confined to the conjunctiva and Meibomean follicles; but in many cases it is attended with the common symptoms of inflammation of the lining membrane of the nostril, fauces, and trachea. It commences with an increased secretion of mucus, and a sense of itchiness, heat, and pain of the eye. The conjunctiva, more particularly where it lines the eye-lids, is red, and the vessels which appear on the

sclerotic conjunctiva are reticulated in their course, and superficial. In some severe cases chemosis takes place, sometimes to a considerable extent. The sense of pain, which occasions a distressing feeling of roughness, as of hot sand under the upper eye-lid, from the rubbing of the very sensitive eye-lids on the enlarged vessels of the sclerotic conjunctiva. This feeling is often very painful, and is very characteristic of this form of ophthalmia. The pain increases towards night, especially when the ophthalmia is of a rheumatic type, but diminishes as the patient gets warm in bed, and he sleeps without inconvenience as the eye remains at rest. In the morning, when the patient uses the organ, the pain is again felt in the eye and forehead.

The discharge, which on the first invasion of the disease was copious, clear, and transparent, as the disease advances diminishes in quantity, and becomes thicker and more consistent in quality. The Meibomean secretion participates in these changes, and concretes on the edges of the lids, so that the eyes are opened with some difficulty in the morning. If neglected the discharge becomes puriform, and has the power of propagating the disease by contact.

The exciting causes are exposure to cold air, more particularly when it blows in currents upon the eye, and when combined with moisture. Damp feet, and any sudden check to perspiration, are liable to produce the disease, more particularly when the body is heated, and debilitated by intemperance. Previous attacks of inflammation of the eyes, or over-excitement, predispose to attacks of ophthalmia. It often happens that a number of persons are exposed simultaneously to the exciting causes, so that the disease sometimes appears in the form of an

epidemic. This more frequently occurs in armies, fleets, &c. In other cases the exciting causes are rife in particular countries, where this disease is in consequence very common. Thus the hot and dazzling sandy plains of Egypt, with the cold and damp night air, render this disease very common in that country; where it becomes contagious and even infectious, in a very aggravated form.

This disease is kept up by general ill health, by bad food, by the want of cleanliness, and by exposure to the inclemency of the seasons in unhealthy situations. In consequence of the difficulty of removing these causes, the disease is often difficult to be cured, and is liable to relapses.

In other cases it produces onyx, or effusion of pus between the lamellæ.

Should proper means not be employed the disease continues: the cornea ulcerates, the external surface of the eye-lids becomes rough, and rubbing continually against the cornea brings on a vascular and nebulous state, followed by a dense opacity of the upper part of the cornea.

The treatment of this form of disease should consist in the application of a few leeches when the inflammation is severe, and a dose of calomel and aloes at night, with castor-oil in the morning. The patient's diet should be easily digestible and nourishing, and he should breathe a pure, temperate, and dry air. The principal reliance, however, is to be placed on the local application of stimulants, such as the solution of the nitrate of silver, the solution of corrosive sublimate, and the red precipitate ointment about the size of a hemp-seed melted on the hand, and smeared along the edges of the eye-lids. Scarifications may be resorted to when there is some degree of chemosis

and a puriform discharge. Blisters to the back of the neck and behind the ears are useful, particularly when allowed to heal, and then repeated. The inside of the eye-lids should be frequently observed, and any appearance of granulations is to be repressed by the application of the nitrate of silver, or the sulphate of copper. When complicated with scrofula, or its peculiar disease, a necessary modification must be made in the treatment. The following is the common form and course of this variety:

J. Potter, æt. eight, of a weak constitution, was a student in one of the Academies in Calcutta, and during the month of August, 1842, while the weather was variable, he was attacked with acute inflammation of the conjunctiva, with a purulent discharge. His brother, æt. 13, was attacked exactly in the same way, but the attack being more recent was more easily checked by the application of leeches, with aperient calomel purges, blisters, and the zinc, and acetate of lead washes, with tonics, and a nourishing diet. In these cases the pain and redness first disappeared, the purulent changed to a serous secretion, and the eyes were slowly restored to their usual healthy state.

The more aggravated forms of this disease pass into the form of ophthalmia which we shall next consider.

3. *Purulent Ophthalmia.*

This disease appears under different forms and designations; according to the cause which produces it, and the age of the individual attacked. Sometimes the cause affects a number of individuals, when the disease becomes contagious to those so predisposed. Such distinctions do not require a separate con-

sideration. In all cases the disease is essentially the same, and does not vary in particular situations, ages, and temperaments any more than does the treatment of the different stages. For these reasons I shall consider them under the head of purulent ophthalmia of adults, and shall add a few separate remarks on gonorrhœal ophthalmia, the purulent ophthalmia of infants, and the epidemic form of purulent ophthalmia.

Purulent ophthalmia of adults resembles, in its commencement, catarrhal inflammation of the eye. It usually attacks both eyes, commencing often in the right, and it is not till a day or two after that the left eye is affected. The primary affected eye is always more severely attacked than the other. The disease commences with an uneasy itching or smarting sensation in the eye, a weight in the lids, and pain on exposure to light. The conjunctiva, particularly the palpebral conjunctiva becomes red and tumid, and the eyelids swollen. The swelling increases, and the eyelids become of a deep reddish hue, and so much swollen and stiff, that the patient cannot raise the upper lid. In some cases the palpebræ, especially the superior, are enormously swollen from infiltration into their cellular tissue, so that they can only be separated slightly and they are of a darker or redder colour than natural. In some cases the swelling of the conjunctiva is so great from the effusion into the cellular tissue that it is protruded under the border of the lid which thus appears everted. In most cases, on separating the lids, the conjunctiva is found acutely red and raised into folds, one of which surrounds more or less completely the cornea, which appears buried under the overlapping folds of the distended conjunctiva, which is thickened and has a villous surface, (see plate 2, fig 1). These elevated folds are produced by a deposit of serum and fibrine into the

cellular tissue, between it and the sclerotic—and is called chemosis. The palpebræ become more distended, tumid, red, and painful. The chemosis may form round only a portion, or the whole of the cornea, and the deposit is said to render the ocular conjunctiva so tense on the part, which is firmly bound down over the junction of the cornea and the sclerotica, as to impede the circulation through its vessels, and a part or the whole of the cornea mortifies. In such cases the cornea first assumes a nebulous appearance, from its pressing out the interlaminar fluid, and the laminæ are thus condensed. This nebulous appearance is succeeded by a dull opacity of the cornea, which loses its brilliancy.

The discharge is at first thin, acrid, and mucous, but it soon becomes opaque, and in twenty-four hours it is thick, yellow, or greenish. This muco-purulent matter is secreted in considerable quantities.

The pain is very severe and is of a throbbing nature, the eye feels very full and distended, and the pain extends to the ball of the eye, temple, and forehead. The pulse in the native is generally harder and increased in frequency, and there is an augmentation of heat in the skin, and thirst. The tongue is white, and the bowels torpid.

These acute symptoms are not of long continuance, but the exact period at which they cease and the atonic stage commences varies with the cause, and the habit of body of the individual. In the atonic stage these symptoms appear to be the effect of a congestion in the vessels of the part, rather than to proceed from an active cause. In this stage the patient feels weak, and the acute symptoms are mitigated.

When the disease is neglected in the first stage, as is so frequently the case in this country; and sometimes, even when most

judiciously treated, the cornea sloughs. In such cases the cornea appears clear, and of the natural colour, without any appearance of vascularity during the first and second stage of the disease; and it is only when the ophthalmia is at its height, or when the inflammation has begun to decline, that the cornea becomes principally affected. The inflammation in the cornea is not apparent, unless by its consequences, ulceration and opacity. Sometimes the ulceration commences in a small superficial portion or circular line near the circumference, and layer after layer of the cornea is destroyed, until it is penetrated at a point, and the aperture assumes a rounded shape, through which the iris protrudes, and thus closes the breach. On a careful examination of the eye in such cases, the conjunctiva will be found thickened and the vascularity extended two or three lines over the transparent cornea, which forms part of the chemosed surface. In the acute stage this central portion of the cornea is at first clear, and of a natural appearance, though sunk in the inflamed and thickened conjunctiva. The ulceration may extend round the central uncovered portion of the cornea, which becomes cloudy, with white streaks and patches. As the opacity increases, the whole cornea becomes yellow, pulpy, and fibrous, and on being separated a discharge of the humours, and a collapse of the eye succeeds.

The cause of the ulceration and sloughing of the cornea is supposed to be the pressure produced by the distended chemotic conjunctiva preventing the passage of the blood to the cornea, and thus producing a sloughing of the cornea. A careful examination of the subject induces me to believe with Mr. Walker, that the ulceration and gangrene are produced by the intensity and peculiarity of the inflammation,

1stly. Because the anatomical structure, and physiological offices of the parts must prevent such strangulation.

2dly. Because severe chemosis is often present without any ulceration or sloughing, and

3dly. Because sloughing sometimes occurs without being preceded or accompanied by chemosis.

We have already observed that the thickening and vascularity extend over a portion of the transparent cornea, when the vascularity suddenly terminates. It is at this point, where the inflamed conjunctiva joins the transparent cornea, that the ulceration takes place. On the inflammation declining the thickened conjunctiva disappears, and the whole extent of the cornea becomes clear, with a circular groove sometimes encircling the cornea three lines from its attachment to the conjunctiva.

The causes of this disease are the various irritations which in a certain state of the constitution, or part, produce this peculiar form of inflammation. Thus it may be produced by exposure to vivid light, more particularly that which is reflected from heated white surfaces, or from the reflection of still water. This effect is much increased on exposure to the cold moist dews of night, particularly at the full, and change of the moon. Another cause is contagion, which may act—

1stly. By the application of the specific discharge to a healthy eye; or

2dly. By the metastasis of the disease from one mucus surface to another.

The disease may thus be produced by different causes, but being always the same in its nature, requires the same treatment, varied according to the constitution of the individual, the violence of the symptoms, and the stage of the disease.

Gonorrhœal Ophthalmia. The ophthalmia produced during the course of gonorrhœa so nearly resembles purulent ophthalmia that it will only be necessary here to remark the peculiarities which distinguish the two diseases.

Gonorrhœal ophthalmia is either produced by the application of the specific secretion to the eye; or by the metastasis of the disease from one mucus surface to another. There is no doubt of inoculation being a frequent cause, and facts seem to prove, and analogy confirms, the passage of the disease from one part of the body to the other. This is more readily understood from the similarity of tissue, and the state of the system affected by the same diseases in another part. This form of ophthalmia generally commences in and continues to affect one eye, which follows the course of the most violent and rapid forms of purulent ophthalmia.

The *treatment* of purulent ophthalmia of adults must vary with the constitution of the individual, and the stage, and violence of the disease. When the disease attacks a young plethoric individual, and he is seen in an early stage, when the acute symptoms are present, blood is to be removed from the arm so as to diminish the frequency, fullness, and firmness of the pulse. When the person is not so strong, the symptoms not so acute, and the disease is in its secondary stage, topical bleeding will be sufficient. When chemosis is present, Mr. Tyrrell recommends that the engorged vessels should be scarified. For this purpose an assistant raises the upper lid as far as possible, and the operator depresses the lower lid, while he passes a cornea knife into the sclerotic portion of the ocular conjunctiva close to the cornea, and draws it outwards so as to make a free incision into the loaded cellular

membrane, taking care not to injure any other texture. The direction of these wounds should correspond with the intervals between the insertions of the recti muscles, so as not to injure the principal vessels of the conjunctiva of the globe. Six or seven such incisions may be required. Warm water should be used to encourage the bleeding; and if the pain returns, leeches should be applied freely to the palpebræ. I have tried this method in several cases very favourable for such a treatment. In one of these patients both eyes were scarified, and in the other only one eye was affected. In both cases ulceration took place at the edges of the wound, and the corneal ulceration was increased, so that in both these cases the scarifications did injury. This appears to be in consequence of the weaker state of the constitution in this country, and the less acute form of the disease. In other cases I have repeatedly made longitudinal scarifications over the chemosis and the repeated application of leeches has produced the best effects, as they lessened the congestion, and stopped the progress of the disease. In these cases the guttæ argent nitrat, blisters, &c. were employed with the best effect in the severe forms of the disease.

Purgatives are next to be given, so as to produce watery stools; diaphoretics, more especially Tartrate of Antimony, in quarter or half grain doses, should be administered so as to produce nausea, and calomel and opium should be given every six hours.

When the inflammation has been diminished by the abstraction of blood, by the nauseating doses of the Tartrate of Antimony, and purgatives; I then apply the nitrate of silver in substance over the chemosed surface with the best effects, taking care to wash the surface after the application of the caustic, and before

the lids are closed. This method was first recommended by Mr. Walker of Manchester, and I can recommend it with confidence in the above cases. The application causes pain at the time, but it is soon followed with great relief.

Much care and attention are required to mark the time when this treatment is to cease, and the astringent and corroborantive one is to commence.: for if the one be continued too long, or the other commenced too early, it will aggravate the disease, which at that stage is succeeded by the almost inevitable destruction of the eye by the sloughing of the cornea. It is fortunate that the time of transition is with a little attention sufficiently distinct. The indications are as follows: A softness and smallness of the pulse, diminution of the pain, moisture and coolness of the skin, a degree of languor of the body, and coldness of the secretions of the eye. When these symptoms are present the second or atonic stage may be said to have commenced. In this, the second stage, the solution of alum, and liq. plumbi acetatis, diluted or in the pure state are to be used.

A collyrium of the oxy-muriate of mercury in rose-water is advantageously used in severe cases. The solution of the argent nitrat is also highly recommended, and a mixture of one part of citrine ointment and three of fresh lard is to be applied at night to the eye-lids of the affected eye.

Along with the stimulating and astringent collyria, tonics are to be given internally. The one which is usually administered is an infusion of chareyta and a decoction of bark, with or without a small dose of the carbonate of ammonia. These strengthening medicines are particularly required when a sloughing of the cornea threatens.

The following cases of purulent and gonorrhœal ophthalmia, will exhibit the usual course, and treatment employed.

Case of Purulent Ophthalmia.—Orno, aged 10 years, was admitted into the Hospital on the 6th September, with an attack of purulent ophthalmia which had commenced ten days before. The purulent discharge was not great; but there was severe pain in the eye, with chemosis round the cornea, near the margin of which a small oblong ulcer had formed; at one point it had penetrated through the cornea, and a portion of the iris had prolapsed, near which part a portion of the cornea was opaque. Eight leeches were applied, a calomel and jalap purge was exhibited, and the chemosed surface was freely rubbed with the nitrate of silver in substance. This caused considerable pain, which continued for an hour and a half.

7th. The chemosed part not diminished, cornea generally clear, and the prolapsed iris not increased. The nitrate of silver in substance was again applied, and produced much less pain.

8th. Chemosis much diminished, no pain; a part of the cornea still opaque; bowels not open.

11th. The bowels kept open with aperient pills, and the bark mixture. The solution of the nitrate of silver produced a marked improvement. The cornea is now of the usual size, the ulcerated part is seen three lines from the border, with the opaque part of the cornea diminished, and a small black point indicated the protrusion of the iris.

19th. The same treatment was continued with the application of a stronger solution of the nitrate of silver. The eye clear, and inflammation gone: discharged from the Hospital well on the 14th of Oct.

Case.—Prusto Panda, æt. 26, was admitted on the 28th of

August, with purulent ophthalmia of the left eye of 20 days' standing; and considerable chemosis round the cornea. A calomel purge was administered after the application of eight leeches.

29*th*. Pain diminished, and as he did not sleep well calomel with opium and hyoscym. was given at night. A blister was also applied behind the ear, and a solution of alum used as a collyrium.

30*th*. Radiating scarifications round the cornea.

31*st*. Much improved, tears cold.

Sept. 1*st*. The ulcer round the cornea appears to be increasing, and the extremities of the scarifications ulcerating. Applied six leeches and freely scarified the chemosis longitudinally. The soothing pill at night and a purge in the morning as required.

2*d*. Great improvement; and the eye being free from pain, a solution of the nitrate of silver was used, which the next day was increased in the proportion of iv. grains to the ounce of water.

4*th*. Better; ulcer not extending, but the chemosis still considerable; scarifications were again made longitudinally over the chemosis; and Tartar Emetic sprinkled over the blistered part: other remedies as before.

5*th*. Ulcer round the cornea diminished, and redness less vivid; tears cold; same medicine continued.

6*th*. A slight prolapsis of the iris near the circumference of the cornea.

7*th*. Prolapsis rather increased; the chemosis still considerable; applied the nitrate of silver in substance over the chemosis, and granular surface of the lower lid, which after the

application was more swollen and everted. A considerable proportion of sero-gelatinous fluid was secreted from the eye during the day, and the cornea appeared clear. The pain of the application quickly ceased, and the eye became cool and without pain. He was soon discharged well.

Case.—Komul Dass, æt. 35, was admitted into hospital the 27th August, with a purulent inflammation of both eyes of 18 days' standing. There was extensive chemosis of both eyes with deep redness of the lids. The discharge is sero-purulent and hot, with severe pain in both eyes, and in the temples. Circular lines of ulceration near the junction of the cornea with the sclerotica, particularly of the right eye.

In this case 16 leeches and formentations were applied to the eyes, and ¼ gr. dose of the Tartrate of Antimony was administered so as to keep up nausea and vomiting for two hours. A calomel purge immediately, and calomel and opium at night.

28*th*. The free vomitting and purging has diminished the inflammation; pain slight in the right eye: and the secretion more of a sero-purulent nature. A blister to the temple, and a solution of alum was used, with calomel and opium at night.

29*th*. As slight pain was still felt in the right eye eight leeches were applied; and the alum solution, with calomel and opium was continued.

30*th*. The ulcer on the right eye surrounded the cornea, and the chemosis rather increased. Free radiating scarifications were made in both eyes.

31*st*. The inflammation and pain diminished; but towards evening the inflammation increased in the right eye. The scarifications were again had recourse to as before.

Sept. 1*st*. Inflammation much diminished, the secretion

serous, but the scarified surfaces near the cornea are ulcerating, and they appear to increase the ulceration of the cornea, although the chemosis near the part is diminished. The Tartrate of Antimony in ¼ doses was again used, but without much apparent good effect.

2d. The right eye being still painful four leeches were applied. The blister, and the Liq. Ant. Tart. to be repeated.

3d. Ten leeches were again applied, and the other medicines continued; bowels well opened.

4th. As the ulceration was extending in the right eye, and the chemosis was still considerable, these were freely scarified in a longitudinal direction.

5th. The scarifications have done good, and the solution of the nitrate of silver, four grains to an ounce, was of much use. The other medicines were continued, with the exception of the calomel and opium, as the mouth was now sore; the ulcers of the cornea are looking better; those of the right cornea are extensive, and the cornea is small and discoloured.

6th. Right cornea much the same; left eye nearly well, and the cornea large and clear. The right is in a dangerous state. The calomel and opium to be continued at night, and the strength of the solution of the nitrate of silver to be increased to 10 grains to an ℥i. This produced considerable pain at the time, which continued for several hours.

12th. No pain, sloughing of part of the right cornea. The left eye well.

In some cases of purulent ophthalmia a tonic plan of treatment must be followed from an early period. This is exemplified in the following case:

Case.—Kasi Das, aged 45, was admitted into the infirmary

with purulent inflammation; the discharge was considerable, and the swelling of the conjunctiva was such that the cornea could not be seen. A considerable abscess existed in the cellular substance under the skin of each eye. This individual had recently recovered from fever, which left him so emaciated and weak that he could not stand. In this case fomentations and astringents, as a solution of alum and the Liquor Plumbi were used, with tonics and nourishing diet. Under this treatment his system improved, and his eye soon got well.

Case of Gonorrhœal Ophthalmia.—Komal Das, æt. 35, applied at the infirmary on the 27th August. He has still a gonorrhœal discharge. Both eyes are severely inflamed, with chemosis and ulceration round the cornea of the right eye. The pain is severe both in the eyes and temples.

Sixteen leeches were applied, and a quarter of a grain of Tartar Emetic was given four times, at intervals of half an hour. A dose of calomel and aloes immediately; three grains of calomel, with half a grain of opium and two of henbane at night with fomentations, and a dram of compound Jalap powder in the morning.

28*th*. Pain in the right eye continued, that in the left much diminished. The swelling is less, and the purulent secretion more serous. Was freely vomited and purged; a blister behind the right ear, and a solution of alum to the eyes.

29*th*. Pain much diminished in the left, that in the right eye considerable. Eight leeches to this eye. Continue the calomel and opium, with alum solution.

30*th*. Ulceration of the right cornea rather increased. Free incisions from the cornea outwards in a radiated direction. The Tartrate of Antimony repeated.

31*st*. The inflammation and pain diminished, but the pain in the left eye increased this morning, when scarifications were made in this eye as above. A solution of the Tartrate of Antimony was repeated, with occasional leeches, and the other medicines.

Sept. 5*th*. Mouth sore, cornea clearer, ulceration has a more healthy appearance, and the secretion being serous and cold, a solution of lunar caustic, gr. iv. and ℥j. of water was used with an aperient, and the Liq. Ant. Tart.

6*th*. The left eye nearly well, the calomel and opium to be given only at night. The nitrate of silver solution was increased to grain x. to the ounce. The sloughing of the right cornea was still threatening; a portion on the outer side being opaque.

8*th*. The slough of the cornea appeared more marked, and the Bark mixture was used.

10*th*. Considerable improvement, appetite improved, the cornea appears more healthy.

18*th*. The same treatment continued, with the occasional employment of the solution of zinc, leeches and blisters; and the strength of the solution of the lunar caustic was decreased. To-day the complete circular ulcer was seen, in consequence of the redness of the conjunctiva subsiding. It was situated two lines from the edge of the cornea. The ulceration had rounded edges, and the opaque part was rapidly disappearing.

The same treatment was continued till the 10th October, when the patient was discharged cured, and in good health.

Purulent Ophthalmia of Infants.—The violent nature and destructive consequences of this disease are frequently witnessed in this country. Indeed, it is a frequent cause of blindness.

Purulent Ophthalmia in infants is generally produced by exposure to a too intense light, or to cold and damp, soon after birth; another cause is the vaginal secretions of the mother coming in contact with the eyes of the infant in its passage into the world. Irritation, therefore, whether specific or not, may produce this disease; and the retention of the discharge in consequence of the infant always remaining on his back produces an ulceration of the cornea. The most frequent period at which this ophthalmia takes place is two or three days after birth. In other cases it may occur in a week or month after that event; but it seldom appears later than three months after birth.

The production of this, as of other forms of the disease, appears to depend in a considerable degree on the peculiar state of the constitution, when exposure to any of the usual causes will be likely to produce the affection. This appears to be proved from the fact that purulent ophthalmia may run through its entire course previous to birth (see Mr. Walker's Lectures, Lancet, February, 1840, p. 713). The redness, swelling, and intolerance of light, are the first symptoms of inflammation observed in the infant; and the increased flow of tears in the first stage, changes quickly to a purulent discharge. The inflammation of the conjunctiva in this form is not always so considerable, and the cornea becomes impaired more from the lodgement of the matter upon it, than from the violence of the inflammation. When this is allowed to rest in the eye, it produces that hazy or cloudy appearance of the cornea, which indicates the extent of the succeeding sloughing.

It frequently happens in this country that parents do not apply for assistance until the acute symptoms have been

succeeded by the chronic stage, when the swollen conjunctiva discharges a thin yellowish pus, the pulse is weak and soft, the countenance sallow and anxious, and the whole constitution is enfeebled and depressed.

The same principles of treatment are to be followed with infants, as have been recommended with adults. It is not often that the disease is seen in an early stage, or the symptoms are so severe as to require more than one or two leeches in the immediate vicinity of the eye while they sometimes require to be repeated, though this in general is not necessary. In such mild cases, fomentations, alterative aperients, with astringents, and corroborants should be used; such as the alum wash, and sometimes the Liquor Plumbi. In the second stage the nitrate of silver, in the proportion of one grain to an ounce of water, and other gentle stimulants should be applied by means o a syringe, to excite the relaxed vessels, and will be found most useful in completing the cure. This treatment will in a large proportion of cases be sufficient in this country. In other forms the solution of the nitrate of silver will require to be increased from ten to twenty grains to the ounce of water and should be applied three or four times a day.

During the employment of these remedies, constant attention should be paid to cleanliness, without which the remedies mentioned will be ineffectual. The nurse should be provided with a piece of soft linen to remove the discharge as soon as it is formed. This should likewise be done during convalescence, as otherwise relapses will be liable to occur. During the treatment the child should breathe a cool and pure air, and if no diarrhœa be present, a little rhubarb and magnesia should be prescribed, as required.

By following this plan, in a large proportion of cases, the child will be able to open his eyes on the second or third day, and the worst cases will usually yield about the tenth day. When the disease is protracted from local or constitutional weakness, the muriated tincture of iron may be given with advantage in the breast milk, and the vinum opii may be occasionally dropped into the eye.

4. *Epidemic Purulent Ophthalmia.*

The following remarks chiefly relate to the disease as it has appeared at different times in the schools in Calcutta, more particularly in the Orphan Institution.

This noble institution is intended to afford a refuge for the orphan children of British soldiers who are usually admitted from the age of four to eight years. In a few cases only are they received under, or above those ages: and after their education they are usually provided for in the army. At the time when ophthalmia made its greatest ravages, the number of children in the institution varied from 620, to 680; and at that time it was probably the difficulty found in attending strictly to cleanliness, proper clothing, diet, and in preventing exposure to the sun, in such an unhealthy climate as that of Bengal, which rendered the children, peculiarly subject to the disease.

In former years the school was rarely free from this disease, but it is now scarcely to be seen in its epidemic form; and it is important to point out the means that were so effectually employed to check its spreading, and prevent its recurrence. This is the more necessary, as the epidemic form of Purulent Ophthalmia has not yet obtained a separate consideration, and

as the disease is often seen, and occasionally assumes that form, among children in India; producing from improper treatment, a loss of strength, and not unfrequently the destruction of vision. The subject appears to me to be deserving of consideration, not on accounnt of any specific difference in the disease itself, as requiring a modification in the treatment, and in the means of arresting its progress, and preventing its recurrence.

The influence of an Indian climate on European children is very peculiar, as they usually remain in good health until the fifth or sixth year of their age, after which time they become weak, and very subject to disease. In many cases these children are further predisposed to disease by their Eurasian-pedigree, by neglect, by bad food, and by exposure to the weather, in unhealthy situations. Such predispositions are further increased when numbers of such children are brought together, in crowded and shut up rooms, without any proper conveniences during the night. In some cases the food may not have been always of a proper quality, or in sufficient quantity, or given at regular periods, or sufficient attention paid to cleanliness, or to clothing. The children too are often exposed to the heat and glare of the sun; to hot, cold, and damp currents of air during the night, after having been exposed to a high temperature during the day, with few amusements, and perhaps without being regularly exercised in the open air. In such cases that debility which the climate produces, and which is always accompanied by a weakness of the eyes, often terminates in sporadic cases of ophthalmia in private families, and in large establishments, on any considerable exposure, more particularly during the prevalence of wind at the changes

of the seasons, especially when it is cold and damp. Under such circumstances, the Purulent Ophthalmia has appeared in the epidemic form, and often spread to a distressing extent, unless energetic measures were immediately taken to arrest its progress. There are very few even of the best regulated schools in Calcutta in which Purulent Ophthalmia has not made its appearance, and in some cases spread to an alarming extent. As the predisposition to the disease increased, the number attacked, and the violence of the disease rendered the cures more uncertain, and protracted. These circumstances explain why so many were affected at the same time, as well as their liability; and account for weak children being more subject to the disease than the strong, and for persons being less liable to be affected after the twelfth year than before that period.

No regular records seem to have been kept at the Orphan Institution, Calcutta, before Dr. Nicolson took charge of the Institution in 1812. From those contained in the Secretary's office, the following approximative statement of the effects of the weather was formed. During the months of November, December, January, and February, while the cold northerly airs prevailed, ophthalmia was generally of less frequent occurrence, and its effects were less violent. This result was still more evident in March and April when light southerly winds prevailed. As the sun became more powerful, in May and June, the frequency of cases of ophthalmia increased, and again declined in July; and during August, September and October, when the air was moist and temperate, ophthalmia was more rarely seen. These varieties in the seasons, and other causes, operated in modifying the violence and frequency of such cases of purulent ophthalmia as made their appearance. The preva-

lence of a dry northerly wind, or sometimes a hot wind, seemed to produce in some cases an epidemic among the children predisposed, and generally for a short time, committed great ravages; sometimes, under these circumstances, the hospital was filled in one day; and again after a time the disease rapidly declined. In all these cases certain unknown atmospheric changes acted in producing and spreading the disease among individuals predisposed to it. At such times one eye was generally attacked and with greater violence than the other, from a natural weakness, and predisposition. For a like reason, when the specific contagion was applied to the eye, the disease was for a time confined to that eye; but the predisposition arising from the unhealthiness of the climate, and the weak state of the patient's health, acting in unison with the natural sympathy between the eyes, tended, though without any actual application of the exciting cause of inflammation, to produce a like inflammation in the other eye. In many cases of Purulent Ophthalmia, the second eye may be inoculated by the matter conveyed by the fingers or apparel of the patient. It was believed that in some cases the disease was spread by the morbid matter being conveyed to the healthy eye, in order that the boy might escape from the school exercises.* One strong proof of such practices having existed in the Lower Orphan School is the fact that a large proportion of the new cases of inflammation of the eye ap-

* "I have understood," adds an able practitioner, "from some of my medical brethren, that whilst the ophthalmia raged in the Free School, it was notoriously known that the boys inoculated one another in the hope of being sent to Hospital, and thus exempt from the school exercises."—*Report of Dr. Nicolson, dated 4th January*, 1815.

peared early in the week, or soon after the pupils were allowed, on Sundays, to mix with each other, to play together without restraint, and had consequently opportunities of conveying matter unobserved from one to another. What strengthens this opinion is the fact, that on the disease being remarked, and the sick being separated from the healthy boys, it was not only checked, but eradicated for a time.

From a careful consideration of the subject, it appears that the disease may occur epidemically, among those predisposed to it, during certain states of the atmosphere; that it may be conveyed by inoculation, and under certain circumstances, as a want of proper circulation in houses where numbers are congregated together, when the purulent ophthalmia may even become infectious.

This variety of ophthalmia is characterized by the usual peculiarities of epidemic diseases: such as its fluctuating nature, appearing at certain seasons; at first affecting a few, but in a severe form, and becoming milder in its course as the disease spreads more generally among a number of individuals collected together. These peculiarities are exhibited in the following description, drawn up from the reports of several intelligent surgeons of the Lower Orphan Institution, and from my own experience of the disease, which has been considerable.

The first symptom of this distressing complaint, is a duskiness of the cornea and an appearance of large tortuous vessels running along the sclerotic coat. In other cases there is a distention or thickening of the conjunctiva, where it covers the ciliary edge of the lower palpibra. On everting the lower lid, in either of these cases the lower palpibra will be found consi-

derably inflamed, with a line of purulent matter filling up the angle formed by the duplication of the conjunctiva before it ascends on the globe of the eye. During this stage the patient feels little or no pain, and there is often little appearance of inflammation; and he does not apply for assistance during the frequently slow course of the first stage, or until the inflammation has advanced further. It consequently requires the utmost vigilance to detect such cases in this primary stage, more particularly as the disease is often carefully concealed from a sullenness of disposition in many of the boys, and an aversion to take medicines. It is therefore of great importance to examine all the eyes of the children, when the disease is at all suspected. After the acute symptoms have been subdued, a chronic inflammation is often left, which should be removed before the patient is considered as cured. This is often accomplished with much difficulty, and is the more necessary, as it is liable again to assume the acute form from slight causes, and thus endanger the organ. The puriform secretion from such an eye is as contagious as in the acute form. These facts are of importance as pointing out the necessity of persevering in some plan of treatment till the remains of the inflammation is removed.

The more acute form of the disease is characterized by a state of redness, and of chemosis of the conjunctiva, which often protrudes for a considerable distance beyond the lids, with such swelling of the neighbouring parts as to conceal the cornea, and prevent the patient from opening his eyelids. During this stage there is a copious purulent secretion, which often excoriates the skin wherever it comes in contact with it.

These severe symptoms of inflammation are accompanied with little pain, and in the cases in which the degree of redness

and swelling was greatest, the local pain was often least distressing: whereas in nearly all the cases in which the disease was followed by permanent injury to the Cornea, the local symptoms of inflammation were comparatively slight, although they were accompanied with intolerance of light, and pain in the eye, which sometimes extended to the temples. The great swelling and redness of the conjunctiva which constitutes chemosis is produced by the inflammation of the conjunctiva, and the infiltration of serum and lymph into its cellular tissue; hence we often see extensive serous chemosis occurring on slight injuries, and other causes of inflammation applied to the eye of the old and debilitated. These symptoms are, however, less marked when the sclerotic coat is more deeply involved in the conjunctival inflammation; as it will involve the iris and coroid coat, which produces great pain, and intolerance of light. In such cases it will be much more liable to involve the cornea in the disease, which is more or less injured.

In these cases of epidemic purulent ophthalmia, febrile symptoms are not always detected, which shows that the stronger antiphlogistic remedies are not required, to subdue the local inflammation; and proves that the constitntion is debilitated, and that nature requires to be supported, so as to prevent the distressing consequence of the local inflammation. This consequence is ulceration of the cornea, which requires the use of tonics and a generous diet. When the disease has remained some time, or has not been completely cured; it often becomes chronic, and from its being confined to the lids, and not being accompanied with pain, or even great weakness of sight, it is often overlooked. In cases in which the eyelids are inverted, a line of mucus will often be found along them and they

appear red and thickened, with granulations upon their internal surface. These are pale, and soft, but slowly harden, and after continuing a long period produce a weakness of vision, and there is always a liability to a recurrence of the acute form of the complaint. Such chronic forms of ophthalmia are best prevented by improving the general health, and by an energetic employment of local means, to remove the granulations.

The peculiar circumstances in which the children were placed in the Orphan Institution rendered them so susceptible of purulent ophthalmia, that for nearly half a century it occurred very frequently in the epidemic form, and produced the most distressing effects. In February, 1821, there were 438 pupils more or less affected with ophthalmia, and in September of the same year the following melancholy report was recorded.

22 Children were totally blind.
12 ———— nearly so.
58 with opacities and slight ulcerations.
47 blind of one eye.
140 affected with purulent ophthalmia.
——
279

In 1819 fresh infection was brought into the school by some children who joined from the upper provinces, and two years after "the state of the disorder was reported to be as bad now, if not worse, than it ever was at any former period." In the report of that period it is stated "not one of the young children who have joined the school during the last two months has escaped the contagion."*

During these epidemics almost all the young children were

* See Mr. Jessey's Report, dated March, 1821.

attacked with the disease soon after they entered the school; those boys who escaped on their entrance, became less susceptible of it, and were less liable to relapses after they had passed their twelfth year. Many of these children looked pale and sickly about the eyes, and in some cases they had swollen bellies, from indigestion.

This destructive disease sometimes destroys one or both eyes, in other cases it produces impaired vision, from leaving specks in the cornea in the line of vision; or a thickening of the conjunctiva of the neighbouring parts, which often increases on the application of any exciting causes, such a degree of weakness in the eye as to establish a predispostion to relapse.

The treatment of this formidable complaint will be considered under the heads of curative and preventive means.

The first attack of the disease is to be treated by the abstraction of blood from the neighbourhood of the eye, by means of leeches. From three to seven or twenty constitute the number which I usually apply to each eye, when both are affected, the number being varied according to the age and strength of the patient, and the urgency of the symptoms. The leeches may be repeated, if necessary, the following day. When the patient has had previous attacks of the disease, a smaller number of leeches will be required, than under other circumstances. It is seldom that the application of leeches is necessary after the second or third days of the acute attack; but as a general rule they should be repeated as long as pain is felt in or about the eye; and the tears feel warm. The weak state of the health of the children of the Orphan school, and their emaciated condition, arising from the rigorous medical discipline of two days precludes, in most cases, further

depletion. In all such cases the health suffers from the disease; and particularly from the treatment required. "They have all, with scarcely any exception, been afflicted with this disease, two, four, or six times, and many much oftener; other children never recover from those diseases which this state of debility has tended to produce. There are many poor sickly children at this moment in the Hospital, bearing testimony to the truth of this statement, and the mistresses will tell you that those that have had the ophthalmia very often have fallen from their usual appetite for food, have become languid, pale, and emaciated, and gradually pine away and die."*

The disease being local, general bleeding is very rarely required, even in its acute form; a dose of calomel overnight with castor-oil, or a dose of the Compound Jalap powder in the morning, should be given on the first invasion: after which it will be necessary to give from time to time an aperient during the rest of the treatment.

The scarifications of the chemosed and intensely red part of the palpibra, when turgid with blood, will be found of use, particularly when the Liquor Plumbi is dropped upon the scarified part; or the parts are touched with the nitrate of silver in substance. When there is no pain in the eye, and the tears are cold, a solution of the nitrate of silver, from four to ten grains to the ounce of water, will be found of much use when dropped upon the diseased part.

In the chronic stage of the disease the application of the Rusout mixture around the eye will be of advantage. This medicine should be removed with a little water, and again re-ap-

* Report of the state of ophthalmia in the Lower Orphan School, by Mr. Newmarch, dated the 7th of November, 1822.

plied. A blister behind the ear will be of use, but its action is generally required to be kept up, or the blister should be repeated. In other cases the alum, zinc, and nitrate of silver solutions, will be found of much advantage when used alternately, and of different degrees of strength according to the state of body of the individual, and the stage of the disease. In cases in which the disease is obstinate the citron, or red precipitate ointment, will be found of much use when applied to the inner margin of the eyelid, so as to prevent the lids adhering, and these stimulants act favourably upon the inflammation.

In all cases of Purulent Ophthalmia it is of the greatest consequence that the remedies be continued until every symptom of the disease has yielded. Without this very necessary precaution most dangerous relapses will be liable to occur. The removal of the children to another situation, changing their clothes and bedding, and the thorough cleaning and white washing of the house, should be carefully attended to.

Preventative Treatment.

In February, 1821, a medical Committee examined the children in the Lower Orphan School, and they found that the eyes of not fewer than seven-tenths* of the whole number of children in the school were more or less in a diseased state, every one of whom they considered liable to the acute purulent inflammation of the eye on an exciting cause being applied, such as would have had no serious effect on an eye in a sound state. In this condition of the children's eyes, it was considered necessary to separate the sick, and to diminish the exciting causes

* Number in the School, Feb. 1821, Boys 270, Girls 354 : Total 624. Seven-tenths of 624—437-8 diseased.

by the greatest attention to diet, regimen and bathing: under which latter head the Committee recommended that the eyes of each child should be bathed three times a day with a weak solution of the sulphate of zinc, containing a small quantity of Laudanum. It was further recommended that all the interior of the building be white-washed; and that the floors of the school, and dining rooms, be washed every other day during the hot and dry months.

From the above observations it appears that this form of ophthalmia is kept up by the weak state of the constitution, which produces relapses on slight exciting causes being applied. Thus the prevalence of dry and hot, but particularly of cold winds was observed to fill the hospital with cases of ophthalmia (see Dr. Fulerton's report). The same effect was produced on changes of the season, and gradually disappeared after several weeks' continuance, unless proper precautions were used in regard to cleanliness, with a view particularly to prevent the secretion from the disease again coming in contact with the healthy eye, the neglect of which was found to communicate infection to the sound eye.

The following general remarks may be of use in stopping the progress of infectious ophthalmia in schools. They are nearly the same as recommended by Dr. Alexander of London.

1st.—That the eyes of all the children be inspected daily by the surgeon of the establishment. The examination not to consist in a mere casual glance at the general outward appearance of the eye, but the upper and under eyelids should be everted in order to ascertain whether there is any granulated appearance of the conjunctiva, and whether any flakes of purulent discharge are lodged amongst its folds; for the disease will frequently lurk

in a dormant state, and is only detected by a drooping of the upper eyelid, produced by extensive granulations on its inner surface.

2d.—All those children who are affected with the disease in its acute stage should be kept separate from those who have it in a chronic form.

For this purpose, a country house near the banks of the river in a high, dry, and open situation should be selected, to which the diseased may be sent. The change of air in such cases will always be of use.

3d.—Those who have the disease in a chronic form should also be kept apart from those whose eyes are free from the complaint.

4th.—Those children who are affected with the pustular, or scrophulous ophthalmia, should not be suffered to mix with the infectious patients, but may be permitted to remain with the healthy, and of these there are generally many in a large school.

5th.—The detection of a purulent discharge and of a granulated surface of the conjunctiva lining the eyelids, ought to be sufficient warning for a separation of the children.

6th.—The children labouring under the disease ought to sleep in separate beds, and have a separate sponge, bason, and towel. These, as well as the night-cap and pillow-cases should be scalded every 2d or 3d day.

7th.—The apartment should be lofty, and so ventilated that currents of air do not pass over the eyes.

8th.—Whenever the weather or season permits, going out of doors daily is desirable: but it is necessary to avoid exposure to the sun after eight o'clock, or before five in the afternoon, without a shade for the eye; and the light and glare of the

room occupied by the patients should be softened by proper shades or varandahs.

9th.—The eyes should be kept as clean as possible by frequently fomentating them with hot water, and by syringing them with such astringent lotions as the surgeon may deem most advantageous in keeping down the granulations; and if these fail, he must then have recourse to such escharotics as he finds best suited to the state of the disease, and the temperament of the patient.

All such articles of furniture, clothing, books, &c., as can not be thoroughly cleansed and purified, so as to prevent the dissemination of contagious matter among the children, should be destroyed.

The strong love which nature has implanted in the breast of parents would be a sufficient safeguard against the neglect of infants, were it not that they are frequently injured by ill-directed tenderness. It is necessary always to recollect that children are weak when they are first born, and that they gain strength by slow degrees until they arrive at manhood. During this progress they require plain and good food, and temperate pure air to strengthen the organs, and much out-door exercise to develope the corporal parts of the body.

The subject of diet and regimen for children and youths in this country, with a view to the prevention of disease, deserves more attention than it has hitherto received, as sufficient reliance does not seem to be placed on it by medical men in the treatment of purulent ophthalmia. I shall therefore add a few remarks on cleanliness, clothing, and the general health, which may be of use in preventing the attacks of purulent ophthalmia, and in rearing children in the unfavourable climate of Bengal.

Bathing. Children should be bathed twice a day; on their return from their morning exercise, and at five or six P. M., before they leave the house for their evening walk. For young and weakly children the water should be warm, but as the children grow stronger the warm water should be discontinued, and the period of remaining in the bath diminished in proportion to the coldness of the water. Great care is needed thoroughly to dry the skin, and to clothe the child warm so as to ensure a glow upon the surface. When this effect is produced the bathing will always prove beneficial.

Clothing. Flannel should be worn in cold and damp weather. In very hot weather it may be left off, and additional precautions used to avoid exposure to sudden changes of temperature. The child's other clothing should be simple and light.

Sleep should be taken at regular hours, and when the weather is hot upon the floor. in a large elevated dry room, and under the punkah. This, however, should be at some distance, so as to prevent the accumulation of heat and moisture about the body. The hours of sleep should also be carefully observed. For a child of five years, from eight to five in the morning; and one hour from twelve to one o'clock at noon will be sufficient, nothing should be allowed to interfere with the hours of sleep, during which currents of air should be carefully avoided, particularly at night.

Diet. Great attention should be paid to the hours of eating. These should never be varied. Soon after five o'clock, A. M., when the child awakes, a cup of thin arrow-root and milk should be given,—alternately with the same quantity of thin sago and milk, and thin tapioca and milk. At nine o'clock a cup of milk and water is to be given, with a thin slice of

bread. In cold weather a fresh half boiled egg may be substituted, mixed with the crumb of bread.

The *Dinner* should consist either of

1st.—Boiled dhal without butter.

2d.—A simple vegetable curry, without grease.

3d.—A small grilled chicken or piece of kid. The meat is to be removed from the bones, and mixed with mashed potatoes. These should be of the best quality, boiled quickly, and mashed, without the addition of any milk, butter, or the like.

4th.—A pish pash to which a little of the mashed potatoes may be added. One of these dinners should be given in rotation.

A small cup of milk may be given at four o'clock, P. M., with a thin slice of dry bread, and at seven o'clock a cup of thin arrow-root and milk is to be given alternately with sago and tapioca, as in the morning. Strong liquids of all kinds should be carefully avoided.

Medicine.—By varying the diet, as above recommended, the bowels will generally be kept regular, and the less medicine is given the better for the child. This, when necessary, should always be of the simplest kind, such as castor oil, magnesia, rhubarb, manna, or senna tea, with the addition of a little peppermint, and crushed coriander seeds.

Exercise.—As much exercise as the child is inclined to take in this country should be allowed. It should be in as open, cool, and dry a situation, as possible, and evening and morning it should be in the open air; walking is better than riding on horseback, and this is better than riding in a carriage. The kind of exercise should, therefore, be varied with the age and strength of the child.

C. *Chronic Inflammation of the Cornea.*

There are two forms of this inflammation, the one being accompanied with an interlamellar deposit of semi-transparent matter, which gives a muddiness to the eye, the other consisting of a slow change in the texture of the layers of the cornea.

The muddiness of the first variety sometimes is in patches, or extends over the cornea, the surface of which loses its polish, becomes sometimes dimpled with ulcers, and becomes of a general milky appearance, through which the pupil is imperfectly seen. The conjunctiva and sclerotica are slightly red, and these vessels sometimes extend over the cornea, with pain, great sensibility to light, and an increased flow of tears. It frequently happens that the inflammation leaves one eye for a time, and then attacks the other. This change may take place several times in the course of the disease.

This disease is cured with difficulty. The most successful plan of treatment consists in local stimulants to the eye, with tonics mixed with aperient medicines, in combination with the blue pill, or the Hyd. c. Creta. The diet should be nourishing, and the patient should breathe a pure and dry air. In all such cases, however, the cure is tedious, and sometimes uncertain.

The inflammation sometimes extends deeper, and a greater effect is produced upon the structure of the cornea, which becomes opaque, indurated and condensed, from long continued, or repeated attacks of inflammation. In other cases new matter supplies the loss of substance, and leaves a pearly opacity, which is incurable.

In the severer cases the same plan of treatment is to be

pursued, stimulants to the eye, and great attention to the general health.

A more acute form of inflammation, terminating in interstitial abscess, occurs in debilitated individuals, and often destroys vision. This disease deserves a most careful consideration. It usually commences as a white speck with surrounding greyish muddiness of the cornea, with redness of the conjunctiva, great intolerance of light, and pain, which greatly increases at night, and often extends to the head; sometimes, when more chronic, there is vascularity of the cornea, particularly of its upper border. The more acute form is usually a little under, and to the side of the centre of the cornea. Should energetic means not be employed to arrest the inflammation, the abscess rapidly advances over all the cornea, which becomes of a yellowish pulpy appearance, and terminates in the cornea sloughing.

In other cases the abscess increases in size, and bursts either externally or internally. The former, which is the most common termination, leaves a small deep ulcer, with irregular deep edges, which heal very slowly. When the abscess bursts internally the ulcer heals up more readily, and the pus is discharged into the anterior chamber. In such cases, when the purulent matter is in considerable quantity, it will often be of advantage to evacuate the aqueous humours and the pus, which may often be done without pain, and with relief to the symptoms.

Case. Luchmee, aged 40, was admitted into the eye infirmary on the 23d October, 1842, with an interstitial abscess extending over the right cornea, which was reduced to a yellow pulp. Half of the left cornea was also converted into

a yellow appearance from an interstitial abscess. It was advancing rapidly to the sloughing of the cornea. The inflammation of the conjunctiva was acute, and the pain extended to the head. Calomel purges were given, and leeches with caustic drops applied to the eye daily. This was followed by calomel and opium at night, a blister, and a stronger solution of the nitrate of silver.

25th.—By these means the inflammation was diminished, pain ceased, and the abscess was arrested in its progress. A solution of the oxymuriate, was employed with advantage, and a tonic mixture exhibited.

1st. Nov.—The mouth now sore, all the symptoms have rapidly disappeared, leaving only a slight opacity at that part of the left cornea in which the abscess had formed.

The slough from the right cornea had separated, and the irregular puckered dark iris appeared with a small portion of the inner lining of the cornea extending from one side to the other and binding it down. Above and below this band a staphilomatous swelling appeared causing pain and irritation of the eye. On the 2d December I removed the lower half of the swelling, by which a portion of the vitreous humour and the crystaline lense escaped. Next day adhesion had taken place and the globe had collapsed considerably.

Symptomatic Ulcers of the Cornea.

Under this head will be arranged a variety of ulcers, all of which depend in a great degree upon the state of the system. In some cases the ulcers are produced by a debility of the system, or an irregularity in the functions of the stomach and intestines. The severer cases of sloughing ulcers are pro-

duced in sickly infants, or in the course of epidemics in this country by the influence of malaria, and want of nutrition in persons debilitated by severe diseases.

To this order belong the chronic ulcers from granular lids and entropium; penetrating ulcers; circular or cruscentic ulcers; irritable ulcers; and sloughing ulcers.

1. *Chronic or superficial ulcers.*

These ulcers may be produced by the weakness left after inflammation of a part, or by the irritation of granular lids, or entropium. In these cases the ulcers are usually superficial and circumscribed. They often appear without any evident cause, and are neither attended with pain nor vascularity. The intolerance of light is not great. Sometimes they are in groups of small ulcers, like pin holes, with irregular borders, and have more or less of a circular form. Such ulcers are usually seen in the young, and it is often necessary for the patients to look obliquely before they are distinctly seen. In other cases the ulcers are single and circumscribed, and resemble a dimple or depression.

These sometimes heal without a renewal of the substance of the cornea, and without leaving any opacity.

In other cases the depressions extend over a considerable part of the surface of the cornea; which is partially nebulous, with small round or oval ulcers, which extend slowly, and after attaining a certain size remain stationary. These ulcers are usually present without any other of the tissues of the eye besides those affected participating in the inflammation; they often destroy a considerable portion of the conjunctival covering and the cornea thus becomes nebulous. Such ulcers some-

times form in the course of an attack of catarrho-rheumatic ophthalmia.

In other cases a considerable redness of the sclerotic coat, with pain and intolerence of light, occurs which is not benefitted by much depletion either local or general. The cornea then becomes nebulous and vascular.

The surface of these ulcers is rough and clear, edges irregular, a little raised above the surface of the cornea, and of a grey colour, exhibit the other symptoms of a healing ulcer, and they are kept up either by an unusual weakness in the part, as by previous inflammation, or by the irritation produced by granular lids, or by the friction of the eye lashes upon the cornea. The secretion from these large ulcers becomes thick, and of a whitish colour, and enlarged vessels may be seen passing over the edge of the cornea to the ulcers.

These ulcers will be healed by removing the granulations or the entropium, and by restoring the tone of the vessels of the part. This is best done by using a solution of the oxymuriate of mercury, the nitrate of silver or zinc, the vinum opii, or the nitrate of silver, the cetrine, or red precipitate ointment. Some times leeches and purgatives, followed by aperients and tonics, are required with counter-irritants. In many cases the cure of these ulcers is very tedious, and they sometimes require the system to be affected with mercury before they heal. This healing process is known by the dispersion of the nebulous opacity, and the whitish and rounded edges of the ulcers. The cavities of the ulcers slowly fill up leaving no opacity, or such as soon disappears.

The diet of the patient should be throughout simple and nourishing.

The following are two successful cases in which such a plan of treatment was pursued :—

Case. Bishonaut, aged 30, applied at the eye infirmary on the 8th July with a deep ulcer of the cornea, with hypopion, accompanied by great pain and redness of the conjunctiva and sclerotic coat, with iritis.

Leeches were applied to the eye, a calomel purge exhibited, and belladona and camphor applied round the eye.

10*th July.*—Much the same, still complains of pain, a blister behind the ears, apply the alum wash, and continue the belladona and an aperient pill, as required.

13*th.*—Pain much diminished and the slough of the cornea separating. A tonic mixture with the nitrate of silver drops.

20*th.*—The slough embracing nearly all the cornea. Treatment continued.

23*d.*—A marked change is observed this morning. More of the cornea is clear. The pain is much diminished.

24*th.*—The slough is separating and the cornea is clearer.

Vision was partially restored on the patient leaving the Hospital.

Case. Sheik Manghi, aged 22, applied at the eye infirmary on the 25th June on account of an ulcer of the cornea with iritis, produced by a foreign body falling into the eye ten days ago. The ulcer is deep, surrounding a large slough, and there is redness of the conjunctiva. Leeches, calomel purgatives, and fomentations were ordered.

27*th.*—Inflammation diminished, no pain, ulcer more healthy. Calomel and opium three times a day, with belladona round the eye, and nitrate of silver drops to the ulcer.

30*th.*—The mouth is sore. The calomel, &c., to be stopped.

3d *July.*—Better. A blister to the neck.

8*th.*—The anterior chamber filled with pus, ulcer much the same. Tonic mixture.

12*th.*—The slough spreading and the anterior chamber being still filled, the pus was evacuated.

16*th.*—Much improved, cornea clearer, ulcer healing.

19*th.*—Hypopion gone, slough separating, cornea still discoloured with redness and a little pain. The tonic mixture continued with the nitrate of silver drops continued.

23*d.*—Cornea clearing, slough separating. The same treatment was continued, and he soon was restored to a useful state of vision.

In all these cases it is of great advantage to attend to the diet, which should be of easy digestion and generous. The exhibition of the compound kino powder, and the application of laudanum, or the wine of opium to the eye, may likewise be used.

2. *Acute, or penetrating ulcers.*

These ulcers occur in persons weakened by long diseases; or of a bad habit of body, and are attended with much intolerance of light, and a copious secretion of hot tears. In such cases the conjunctival surface of the lower lid when very red should be touched with the nitrate of silver. The application of leeches and calomel purgatives should also be employed. These ulcers are generally of an irregular shape, and are sometimes produced by the bursting of an onyx. Sometimes vessels may be seen passing to the ulcer, and increasing the morbid secretion; but if this action is diminished by proper antiphlogistic remedies these vessels will hasten the restoration of the breach in the cornea. In other cases the ulcer forms on

the surface of the cornea, and penetrates slowly through its lamellated structure until it reaches the membrane of the aqueous humour when its progress is stayed for a while, or even permanently. In some cases the capsule is protruded forward into the ulcer forming what is called *hernia corneæ*. This protrusion of the internal membrane often resembles a vesile, and it sometimes enlarges into a staphylomatous tumor which requires to be destroyed several times with lunar caustic before the cicatrix attains a sufficient degree of firmness to support the aqueous humour.

When the ulcer penetrates through the cornea the aqueous humour is evacuated, and the iris falls upon the inner surface of the cornea, and a part of it protrudes through, and fills up the ulcer. When this is further removed from the pupil the protruded part forms a bag; when near the circumference it should be allowed to remain; but when it is situated near the pupillary margin, it should be disengaged, retained and extended by means of the extract of belladonna. When the prolapsus of the iris fills up the ulcer, it adheres and becomes imbedded in the substance of the cornea; and its black colour, which is at first surrounded by a white healing ulcer, slowly disappears leaving a white permanent opacity, which from its position often, in a greater or less degree, diminishes the power of vision.

When the protruded iris does not fill up the ulcer, a fistulous opening is left through which the aqueous humour distils. In such cases the nitrate of silver is to be applied to the edges of the aperture.

When the powers of life are so feeble, and the ulcer so large as not to be arrested, the discharge of the aqueous humour is

followed by that of the crystalline humour, and the eventual disorganization of the eye.

3. *Semicircular Ulcers.*

This variety is seen in the severe cases of conjunctivitis, particularly in purulent ophthalmia. The ulcer consists of a deep furrow of a greater or less extent round the outer margin of the cornea, two lines from the sclerotic coat. Its margin is slightly rough and opaque, and extends for a short distance on each side of the ulcer. In some cases the ulcer extends round a part or the whole of the centre of the cornea which, in that case, loses its vitality and sloughs.

Another variety of these ulcers is often seen in the old, accompanied with more or less inflammation of the conjunctiva around the cornea, particularly on its outer and inner side. The ulcer commences in a small spot generally in the inside; a second, third and fourth appear further on, and as they extend they unite, having irregular slightly opaque edges. These ulcers are often difficult to be cured. They are to be treated with leeches and aperients, combined with tonics, and the patient should live on nourishing and easily digested food.

4. *Irritable Ulcers.*

These ulcers occur in the middle-aged, when the health is deranged, the digestive organs disturbed, and the individual nervous. Such ulcers are small, at first interstitial, and of a grey colour, with slight accompanying inflammation. They may burst internally or externally, and leave a round jagged edge. There is much intolerance of light and severe pain which occurs in paroxysms, generally towards night.

In some cases it may be necessary to bleed, to apply leeches, and to exhibit calomel purgatives in the first instance, followed up with calomel, opium and hyosciamus, to affect the system. When the inflammation has been diminished a solution of the nitrate of silver applied to the ulcer will deaden it, and the intolerance of light will be further diminished by the application of a solution of the extract of belladonna to the eye.

5. *Indolent Ulcers.*

In children imperfectly nourished, or in the old and infirm, indolent ulcers take on two forms, one being more or less round, and the other of an oblong shape near the circumference of the cornea. These are pale, not painful, and often deep, and attended with the secretion of a thick mucus. They require to be stimulated by the application of a solution of zinc, the nitrate of silver, or a weak solution of the oxymuriate of mercury; in conjunction with tonics and nourishing diet.

6. *Sloughing Ulcers.*

Sloughing ulcers are either the ulceration round a part which is thrown off, or are attended with the formation and detachment of a mortified part. In the first variety an ulcerating line forms round the dead part, deepening gradually until the dead is removed from the living part. In this manner considerable portions of the external layer of the cornea are destroyed, leaving an opaque whitish surface, which remains below the surface of the original cornea. As this part is semitransparent it is of consequence to diminish the nebulous opacity. In a case of this kind now under my charge, in

which two thirds of the cornea had thus been removed, I was able to improve the transparency of the cornea by means of stimulants. The whole cornea may thus be removed, as occurs in the course of severe attacks of purulent ophthalmia. The consequences of this sloughing will be considered under the head of Staphyloma racemosum.

The second kind of sloughing ulcers, which is attended with the formation and detachment of the mortified part, occurs in the feeble and cachectic. These ulcers appear on the cornea without much vascular action, and in their progress the layers of whitish or ash-coloured sloughs are thrown off, which for a time leave the cornea underneath more or less clear. In other cases the whole coruea sloughs. This sometimes occurs in this country in cases of dysentery with extensive organic derangement from exposure to unhealthy situations, and the great weakness produced by want.

Much care and attention are required in the treatment of this most important variety of ulcer. When produced in the young or in very old persons from weakness, the system is to be supported by quinine and nourishing diet, and the healthy action of the digestive organs improved by aperients, and stimulants applied to increase the action of the ulcer. Of these the sulphate of zinc, the nitrate of silver and the oxymuriate of mercury in solution are the best.

When the sloughing process is advancing, the cause, as in purulent ophthalmia, is to be diminished by the application of scarrifications, leeches, &c., and as soon as the inflammation has been reduced, stimulants are to be applied to the ulcerated surface. In the absence of such symptoms perseverance in an antiphlogistic treatment, such as the application of leeches, &c. is

liable to produce injurious effects. I have known a dose of salts increase the slough considerably in one night, and thus destroy the hope of restoring the eye to a state of useful vision.

Section III.

Specific Ophthalmia.

In the numerous varieties of disease comprehended under this class inflammation is frequently a symptom, and generally an unimportant one. In the treatment in each of these diseases the inflammation has specific qualities, as of the skin in scarlatina, measles, and small-pox; certain forms of erysipelas, of buboes, in plague, cynanche parotidea; the inguinal glands, &c., in syphilis; the joints, in rheumatism and gout, &c.

These specific diseases being usually caused by the introduction of a poison into the system produce peculiar effects upon certain tissues of the body. In some cases this form of inflammatory disease is hereditary: plethora too from free living and indolent habits, may act as an exciting cause. In other cases indigestible and slightly nourishing food; exposure to cold, damp, impure air, and unhealthy climates, act in the same way. The weak and infirm state of the body from intemperance and previous attacks of disease predispose the individual to the influence of such causes. In other cases wounds of tissues, in which there is little vital power, as in fascia, or tendinous expansions, certain poisons inserted by wounds or taken into the system in any other manner; and the neighbourhood of foul sores, &c., produce the same effect. In some cases such local effects produce a degree of inflamma-

tion, and neighbouring condensation, which prevents for some time the absorption of the specific animal matter into the system. Thus the cerebriformed, cancerous or circumscribed tumour of the lungs, liver, &c., sometimes, produces such a degree of inflammation and thickening around them as to extend to a considerable distance, and often ulcerate and soften before the parts are sufficiently weakened to admit of any of the morbid matter being absorbed to infect the glands, which are the parts most predisposed to such attacks.

Another remarkable peculiarity of many of the diseases of this order of inflammation is, that a person can generally only be affected once by them, and the young are peculiarly susceptible of their influence. The contagious diseases may occur several times in the same person, as typhus, plague, dysentery; but those which attack persons but once depend on the presence of some specific morbid matter which is generally propagated from one to another, and can thus be communicated to those who have not had the disease before, in constant succession. Such contagion is more virulent, and spreads further in the one form than the other. Great heat or cold destroys the matter of contagion.

The skin is the tissue most frequently affected by this order of inflammation. In these cases the disease generally attacks particular tissues. The absorbent vessels, and particularly the glands are more susceptible of scrofula; while the breasts, testicles, and conglomerate glands are the usual seat of cancer, &c.

These peculiarities in the parts affected seem to be produced by the peculiarity of the exciting causes, as well as of the tissue of the part. This order of inflammation has also specific

qualities, indicated by these products being in one case the deposit of cancerous structure; in another modified pus, by which the disease may be propagated, as in small-pox, &c. In other cases this inflammation is accompanied by the secretion of new parts, which are of a peculiar nature; after peritonitis, deposits of the phosphate and carbonate of lime occur; in some diseases of joints, ivory deposits take place; and after repeated attacks of gout, a new substance, the lithate of soda is secreted.

The secretion from specific ulcerations has the property, when inserted, by inoculation into a healthy person, of generating the same morbid secretion, and producing the peculiar class of symptoms of the disease. This is called immediate, or simple contagion. These effects are produced through the influence of the blood; but not as was supposed to be the case with small-pox, by converting the blood into the same nature, or that it assimilated the fluids of the system which were thrown out upon the surface of the body, by an effort of nature to form the pustules of small-pox, by which it could be generated again, and assimilate other fluids. This was long the opinion of both the vulgar and learned, and was supported by the names of Sydenham, Mead, Van Sweeten, Cullen, &c.

The inoculation of small-pox, vaccination, hydrophobia, certain forms of ophthalmia, syphilis, itch, gonorrhœa, are familiar examples of this kind of immediate contagion.

Specific mediate contagion or infection may be conveyed a certain distance through the air, or attached to clothes or the like, and being inspired is absorbed by the mucous membrane of the bronchiæ, producing the same disease in

another individual. This, however, does not appear immediately on exposure to the infection; but after their introduction into the system the morbid matter remains a certain latent period, without showing its effects. This period varies from a few hours, as in the plague, to 6, 7 or even 10 or 12 days. During this period the poison gives no evidence of its presence, and when once introduced cannot be expelled nor the subsequent symptoms prevented by any means hitherto known. The course of variola may be taken as an example of such a disease. The fever, after the latent period, comes on at a particular time, and not like other fevers in an insiduous gradual manner. The state of fever is distinct, and of various duration. It generally commences with pain in the back and loins, nausea, vomiting; disposition to drowsiness, and coma. Towards the end of the third day, from its commencement, the eruption makes its appearance, first upon the face and neck, and then upon the thorax, abdomen, and extremities. During the fourth day the varioloid eruption spreads over the body, in the fifth small vesicles appear depressed in the middle containing a colourless fluid, and surrounded by an inflamed areola, while the eruptive fever declines. On the sixth the swelling of the throat appears, and extends to the face, and on the eighth day, the pustules are completely formed. About the eleventh day the face, hands and feet begin to swell, and the secondary fever generally makes its appearance. The swelling of the hands and feet gradually subside, and about the seventeenth day the secondary fever disappears.

This peculiar class of disease is therefore produced by exposure to certain specific poisons, is contagious, principally affects the skin, does not usually attack a person more than

once during his life time, and some individuals seem to be exempt from its influence. The causes of these peculiarities are unknown, and until a better explanation can be given, we may say that it depends on a disposition in the nervous system to the disease of which it is not again susceptible. This order of inflammation seems to operate through the blood, or particular structures, and gives rise to fixed, and peculiar, and occasionally to variable effects. These variable effects seem to depend principally upon the nature of the exciting causes.

In plague the fever and external inflammation appear generally within a few hours after exposure to the contagion. The inflammation appears in spots, which rapidly run to gangrene and buboes, or swellings of the lymphatic glands rapidly form, though they rarely suppurate. The re-action is often imperfect, hardly perceptible, and accompanied with paleness, nausea, vomiting, weakness of the pulse, tumors, and confusion of thought, verging on stupor.

The treatment in specific inflammation will vary with the cause producing it. The first indication being to remove the cause, and the second to defend the constitution from its effects, by means of tonics, astringents, antispasmodics, and stimulants; according to the individual circumstances of the case. In other cases cauteries or the knife are required to destroy the diseased part.

In all cases it is of great importance to employ early and energetic treatment in this class of diseases, as in some cases the constitutional effect may be in a certain degree modified, and in all cases diminished in violence by such treatment. Older writers suppose that the poison, after being introduced into the

system, might be expelled by emetics, sweating and blistering, in accordance with their fanciful opinions regarding the humeral pathology.

After these general remarks on specific diseases, we shall find that there are likewise a peculiar characteristic class of diseases affecting the organ of vision. One of these is specific ophthalmia which is attended with a zonular and varicose distribution of the blood-vessels, and affects the fibrous tissues of the eye in particular; as the sclerotic coat, the iris, and the deeper tissues of the eye. These diseases are distinct, but from the connexion of the tissues with each other two or more may be affected at the same time. The secretion of the eye differs in this order, being of a diminished or purulent nature. The pain is deep-seated, pulsative, and peculiarly nocturnal, affecting the circumorbital region as much as the eye itself. The pain commences soon after sunset, increases in violence till after midnight, and abates towards morning. This form of inflammation requires constitutional treatment with depletion.

The ophthalmic diseases of this order are the scrofulous, variolus, rheumatic, gonorrhœal, and leprous ophthalmia, which will be now considered.

1. *Strenuous Ophthalmia.*

The low and damp climate of Bengal, exposure to the weather, the weakness of the inhabitants, and the indigestable food which they frequently use renders scrofula a frequent disease, and the variety of ophthalmia which it produces is often allowed to proceed to the total destruction of the eyes. This is particularly the case in childhood, when parents too frequently defer applying for aid till it is too late to save the organ.

This form of ophthalmia occurs in those of a scrofulous diathesis. It most frequently attacks children and youths. The inflammation is of a chronic nature from the commencement, and has the peculiarity of not being accompanied with much redness or pain, when the person is allowed to remain in a dark room with his eyes shut; the pain increases at night. This disease is accompanied with great intolerance of light, so that the person cannot bear even a very moderate degree of light; and when the eyes are opened with force, the orbicularis palpibrarum is spasmodically contracted, and a gush of tears follows every attempt to open them. As long as the cornea remains transparent, and of the natural colour, there is no present danger of the loss of the eye. Sometimes one eye is alone affected, at other times, and most generally, both are affected, or the disease passes from one eye to the other. In other cases pustules form on the sclerotic conjunctiva, with diffuse inflammation. This is the characteristic difference between this form, and idiopathic pustular ophthalmia.

It is of much importance that the eye be narrowly watched, for should this inflammation, which is confined to the conjunctiva, continue long, it is liable to terminate in ulceration. On a careful examination of the eye in these cases one or more pustules will be found on the cornea. They are usually very small and of an opaque white colour generally near the centre of the cornea; in other cases several may be observed near the edge of the cornea. These are sometimes absorbed, leaving a small opacity; at other times a small dimple, or enlarged red vessels may be seen passing into the pimples, which become a tedious vascular speck, that is cured with difficulty.

In many of these cases of ophthalmia the pustules become

vascular, suppurate, burst and terminate in ulcers sometimes superficial and of a considerable extent, and at other times deep and funnel-shaped. This is one of the most dangerous symptoms of the disease; as it usually leaves, even under the most favourable circumstances, a permanent opacity of the cornea. The ulcer increases, with the pain and intolerance of light; and not unfrequently it penetrates through the cornea, when the aqueous humour is discharged, and the iris protrudes through the opening. In such cases the surgeon should endeavour to draw the iris away from the cornea by the application of belladonna. If this is not speedily done the iris unites to the edges of the ulcer, which becomes white round its edges. The iris slowly disappears, and a white indelible cicatrice of the cornea is left.

The morbid sensibility in this disease may depend, as Mr. Travers supposes,* on a morbid sympathy of the retina with the secreting surface of the primæ viæ and the skin, hence the advantage derived from calomel, diaphoretics and anodynes.

When the strumous ophthalmia is acute and recent, and the person strong, leeches should be applied round the eye, and repeated if necessary. The use of the tartar emetic to produce vomiting, or to excite nausea, is of great advantage. In some cases it may be combined with a purgative. For producing vomiting four grains of the tartar of antimony are to be dissolved in six ounces of water, of which a table spoonful is to be given every few minutes until vomiting is produced. At longer intervals it will produce nausea, or one or two ounces of sulphate of magnesia may be added to the four grains of the tartar emetic and dissolved in a pound of water, of which

* Page 93.

two or three table spoonsful are to be given every half hour until nausea and vomiting are excited. In the more chronic forms the treatment should consist in a mild depleting plan, or more freely according to the strength and age of the patient, when diaphoretics (Dover's powder), calomel purgatives, or Hyd. c. Creta at night, are to be given to improve the secretions. Tepid baths are also useful. When the fever is gone and the tongue and skin healthy, tonics are to be exhibited: of these quinine is the best, as it exerts a remarkable power over the constitutional as well as the local disease. From one half to two grains three times a day may be used, and belladonna is to be applied round the eye. The carbonate of iron and the tartrate of potassa and iron are also useful. Tonics, particularly in the pustular variety, aromatic bitters, with alkalies and diaphoretics, as Dover's powder, will be found of much use. Warm clothing, moderate exercise in pure air, sea bathing, &c. may be used; and the diet should be light; but as the disease assumes a more chronic character the diet should be more generous.

The local treatment should consist in keeping the eye cool and shaded, and in the first stage cautious depletion, with leeches, warm and moist applications, or decoctions of chamomile flowers or poppy-heads; or the steam of water containing opium, or cold washes may be used, and varied as most agreeable to the patient. These are to be succeeded by mild astringent collyriæ, which are to be varied and increased in strength according to the feeling of the patient. *Blisters* to the temples or behind the ears, or to the nape of the neck, are of much use. They should be repeated.

Setons and tartar emetic ointment are also of use in protracted cases.

A solution of the nitrate of silver is the best application for the ulceration of the cornea. This may be varied with vin. opii; a solution of the sulphate of copper, or a diluted zinc lotion. A weak solution of the acetate of ammonia in rose water, the solution of corrosive sublimate, and the red precipitate salve are also of great use. In chronic cases, in which the palpebral conjunctiva is much loaded with red vessels, scarification is one of the most valuable means of cure.

I place considerable reliance on the application of belladonna to the eye, more particularly for subduing the intolerance of light. For this purpose the eye may be exposed to the vinous solution, raised into vapour, by being placed in a tea cupful of boiling water. It may also be applied externally, or exhibited internally, as recommended by Dupuytren. The following is an example of its use:—

Case. Punchanun Tewary, æt. 29, was admitted into the eye infirmary on the 30th April, 1842, with severe inflammation of both eyes. He appears to have been treated with mercurial purgatives, leeches, and blisters on first being admitted into the Hospital. His system was affected with mercury. When I saw him first, on the 8th of May there was the greatest intolerance of light, and as well as I could see the cornea, it was opaque in both eyes, and he could not see. Tonics and aperients were continued, with the solution of the nitrate of silver. This was left off for some days and again resumed, but without much effect. He had a feverish attack for which the lig. tar. ant. and aperients were used with advantage, but a very marked change was observed on the extract of belladonna mixed with water being dropped into the eye, and a quarter of a grain given at night with quinine mixture in the day. In two days the in-

flammation had entirely disappeared, when extensive opacity of the cornea, and partial closure of both pupils became visible.

It is not, therefore, enough to cure the local effect of this peculiar diathesis, as it will be very liable to recur, or to produce other disease.

The means of preventation consist of :—

1. Tonic collyriœ and gentle stimulating ointments.

2. Nourishing and easily digested food, country air, and shower, or sea bathing.

3. Tonics, such as the infusion of roses, cascarella, columbo, decoctions of bark, with diluted sulphuric or nitric acid; steel, rhubarb and soda, or magnesia, as aperients.

a. *Pustular Inflammation*

Usually appears on the conjunctiva, near the edge of the cornea, with often considerable surrounding redness, and some pain. There often appears a pencil of vessels, which sometimes precedes and at other times anticipates the formation of pustules, resembling the aphthæ of the mouth, fauces, and intestinal canal. In other cases the pustules form on the cornea, which becomes nebulous. The pustules are red, or yellowish, and slightly elevated spots arising from the deposit of lymph, which if not absorbed, become purulent, break, and form ulcers. Sometimes there are only one or two, but at other times there are several round the cornea.

The treatment of this variety is the same as in the other forms of scrofulous diseases. If the inflammation around the pustules is considerable it must be reduced by the application of leeches, and by the evacuation of the bowels by the mild aperients; blisters will also be found very useful. The system at the

same time must be invigorated by tonic remedies, as columbo, gentian, and astringents applied to the vessels of the part. The best astringent collyriœ are: the vinum opii, and the solutions of zinc and alum. The Unig. hyd. nit. the Ung. zinci, or the subacet. plumbi; or a strong solution of the nitrate of silver, and bathing the eye daily with a solution of the muriate of mercury, one grain to eight ounces of water, will be of advantage when judiciously applied, and varied from time to time.

The precipitated carbonate of iron, in doses of from 10 to 25 grains, may be repeated three times a day, when the bowels have been cleansed by aperients.

b. *Granulations of the Conjunctiva.*

Neglected ophthalmia is most liable to produce granulations, or more correctly a state of hypertrophy of the conjunctiva, when the person is of a scrofulous or bad habit of body. The determination of blood, and the altered structure are the cause of a morbid secretion which keeps up the irritation and inflammation of the part, followed by the alteration of texture; from the smooth soft surface to the prominent, and hard granulations, from which an irritating secretion proceeds. These granulations cover the surface of the tarsal conjunctiva, and by continually rubbing upon the globe produces a pricking pain, as of sand in the eye, irritability to light, drooping of the upper lid, which effects and keep up the chronic ophthalmia, accompanied with a vascular state of the sclerotic conjunctiva, and such a degree of nebulous cornea as sometimes to obscure vision, particularly on its upper half.

The granular conjunctiva is often accompanied with vascular cornea, which becomes studded with small superficial ulcers

caused by the irritation excited by the granulations, and when neglected terminate in opacity of the cornea and blindness.

This disease, being chronic in its nature, is allowed by the natives to proceed to the almost entire loss of vision before they apply for assistance at the hospital. Such cases are cured with difficulty, and are subject to relapses.

The treatment of this disease should consist in applying leeches, should the inflammation be considerable, and administering gentle aperients. When the inflammation has thus been removed the lids are to be everted, and the projecting granulations when large may be shaved off with the flat scissors.

c. *Vascular cornea*

When accompanied with vascular cornea the vessels may be scarified at a line from the cornea, while the globe is fixed by the finger pressing upon it from above, which, however, is not often requisite. It is painful and is dispensed with by curing the tarsal granulations by scarifications. When these have been performed, a solution, or thé application, in substance, of the sulphate of copper or nitrate of silver to the part may be employed; but the applications should be washed off with warm water before the lid is closed. The liquor plumb diacitatis, a solution of alum, or the vinum opii is also used with advantage. The lunar caustic—or blue stone, when applied freely, will prevent the regeneration of the granulations.

To these means setons, issues, blisters, and attention to the general health must be added.

d. *Ulcers of the Cornea.*

The strumous ulcers are the most common example of this variety. They occur in children of a scrofulous diathesis; and are characterized by a rugged opaque surface. They are usually superficial and extensive, though sometimes they are more or less deep, circumscribed and vascular. They are accompanied with very great intolerance of light. These ulcers sometimes follow the bursting of phlyctenulæ, which form on the cornea. In these cases one or more ulcers may thus be produced. They are first in the form of a small transparient dimple; but in other cases the ulcers are vascular, extend rapidly through the cornea, and are followed by a prolapsis of the iris. This is sometimes to such an extent as to be succeeded by ulceration followed by an evacuation of the lens, and a collapse of the globe. The more chronic variety of these ulcers are slowly filled up, and leave a small opacity, from the deposit of coagulable lymph which surrounds every circumscribed abscess, and which is gradually removed by absorption.

The treatment of these ulcers will consist in the application of leeches when the ulcers are attended with much inflammation, rest in a dark room, and when very irritable the exposure of the eye to the vapour of hot water in which laudanum or camphor has been mixed. Fomentations with belladonna and hyosciamus will also be found of much use. Scarifications of the inside of the eyelids and counter-irritants followed by stimulants to the eye will be of advantage when the inflammatory symptoms have been subdued; such as a solution of the nitrate of silver, of the oxymuriate of mercury, the vinum opii, and smearing the eyelids with the red precipitate ointment.

2. *Variolous Ophthalmia.*

The acute diseases of the skin, such as measles and scarlet fever, sometimes extend to the sero-mucous membrane of the eye, and produce the usual symptoms of ophthalmia of the conjunctiva, as modified by a scrofulous diathesis. In this country, where a large proportion of the inhabitants continue undefended by vaccination or even inoculation, and where small-pox often appears in its epidemic form, the secondary affection of the eyes is not unfrequently to be seen possessing the same characteristics, and differing only in the degree of violence. In these cases there is a degree of conjunctival redness, with intolerance of light, slight pain, and epiphora. If severe or neglected the disease may terminate in onyx and ulcers of the cornea.

This disease is generally slight, and is easily cured when taken in time. The patient should be guarded from strong light, bathed occasionally with tepid water or poppy decoction, the bowels kept relaxed and the diet generous. In more severe attacks leeches and the use of the solution of the nitras argenti, or diluted vinum opii will be found of much use.

3. *Rheumatic Ophthalmia.*

This disease is produced by exposure to cold and damp. It affects the fibrous sclerotic coat, and the iris; and is not attended with any great increase of the secretions. The deep-seated light zonalar redness appears in the cornea, and the vessels of the sclerotic coat have a straight course to the margin of the cornea, in which there is a feeling of heat and dryness of the eye, which becomes a deep-seated pulsative pain in the

ball and round the orbit and neighbouring part of the head, particularly the eyebrow. This pain is always much increased during the night. It rarely attacks both eyes at once with equal severity; but frequently passes from one to the other. It is often found combined with catarrhal inflammation when it may be called the catarrhal-rheumatic ophthalmia.

The rheumatic ophthalmia is accompanied with dimness of vision, from the haziness of the cornea and pupil. The conjunctiva is of a brownish red mottled appearance, with intense redness of the part lining the eyelids. The iris is generally discoloured, contracted and very sluggish in its movements during the acute stage. It rarely goes on to an effusion of coagulable lymph.

This disease resembles rheumatism in the structure it affects, in the causes producing it, in the nature of the pain, its exacerbations, and its cure. I am not aware of any case on record in which the disease was primary, but in one case distinct paroxysms of rheumatic ophthalmia occurred alternately with what is called gout in the stomach, of which the patient died.

The disease is accompanied with nocturnal exacerbations of symptomatic fever, when the pulse is strong, full, and hard, the skin dry, and hot, the tongue white, the bowels deranged, and the secretions morbid.

In this country the local abstraction of blood is generally found sufficient, although a great many leeches may require to be used, and even repeated. Calomel and opium followed by Dover's and antimonial powder should be used at night, with a purgative in the morning, and a blister to the neck. The moistened extract of belladonna should be smeared round the eye twice a day with warm anodyne applications.

These medicines should be followed by the sulphate of quinine, or mineral acids, Fowler's solution, colchicum, and the carbonate of iron in the chronic stage of the disease, with the other usual remedies for chronic ophthalmia.

4. *Gonorrhœal Ophthalmia*

Has been already described under the head of acute inflammation of the conjunctiva. See p. 40.

5. *Leprous Ophthalmia.*

The following is the common course of the aggravated form of this disease:

A middle aged man was attacked with leprosy, he was excluded from his family circle, and sought to mitigate the severity of the disease by making his peace with heaven. He became a religious mendicant, engaged in the austerities practised by that class, and followed their profligate manner of life. Having been proved to have been concerned in a burglary, he was seized, condemned, and sentenced to be imprisoned for a number of years. He was soon in the Jail Hospital, but the ease, comfort, and regular food which he now enjoyed had no favourable effect on the progress of the disease. The fingers and toes one after the other, became insensible, swelled, ulcerated and discharged pus mixed with bone. On the swelled part large bullæ or flictenicæ formed; the members shrunk, became of a light unnatural colour, and very fetid. A line of ulceration formed between the dead and living part, and slowly the members dropped off. The soles of the feet ulcerated in the form of round, deep grey holes which were insensible, and very indolent. The margin of the eyelids became thickened and

tuberculated ; the eyelashes fell out, the conjunctiva inflamed, an insiduous ulceration surrounded the cornea, which on separating the eye became disorganized. In this manner the unfortunate individual became quite blind before he died.

CHAPTER II.

Inflammation, and other diseases of the Internal tissues of the eye.

These diseases will be arranged under the heads of diseases of the iris, choroid coat, and retina.

Section I.

The Iris, as well as the chambers of the aqueous tumor, have a smooth membranous lining, which presents a striking analogy to that which lines serous cavities ; and when inflamed is charactarised like them by altered secretion, or by effusion on the surface, or into the texture of the organ, and by its being impaired in its function.

Inflammation of the Iris.

As an important practical distinction I shall make a few remarks on accidental, symptomatic, and specific iritis ; as when the disease is produced by wounds or other accidents, by an impaired state of health, particularly when exposed to cold and moisture ; or when the system has been affected with the syphilitic poison, with rheumatism, &c.

Accidental causes.—This form of the disease is produced by direct injuries; such as wounds, surgical operations on the eye, over-exertion, as in regarding minute, or bright objects, &c.

The symptoms are characteristic, and are generally easily detected. The eye appears dull, and muddy; the iris is changed in colour, becoming darker than natural, with a yellowish tinge when of a light colour; and of a deep reddish brown colour, when of a dark hue. The fibrous arrangement of the iris becomes less distinct, and it has often a puckered and a thickened appearance, by the effusion of lymph into its texture. In this condition it is very sluggish in its movements, and afterwards becomes motionless. Another characteristic symptom is a red band or zone of red vessels on the sclerotic coat, near its juncture with the cornea. This zone is not always complete, or uniform; being redder at one part than another, and the iris opposite to it more affected than elsewhere. The patient complains of pain in the globe and orbit, of dimness of sight, intolerance of light, and an increased flow of tears. These symptoms have nocturnal exacerbations, accompanied with fever. The pupil becomes irregular in figure, and the pupillary margin of the iris is thickened, by the effusion of lymph into its texture which produces its change of colour, and the edge of the pupil is turned back towards the posterior chamber. In other cases along the margin of the pupil a circle of pale lymph is visible around its margin, with which it adheres to the capsule of the lens (See Part 1. Fig. 1.) Sometimes the lymph is effused in distinct masses of a yellowish, or red tint. In other cases small abscesses form in the iris; and as it is thus changed, the pupil becomes contracted, and filled up with lymph. If the disease is not checked, an effusion of lymph or matter takes

place in the substance of the iris, and falls into the anterior chamber of the eye, producing *Hypopium.* When such a vascular membrane as the iris is inflamed, its intimate connection with the neighbouring parts is the cause of their participating in the inflammation. This is sufficiently indicated by the redness of the sclerotica; the dulness of the cornea, sometimes proceeding to nebulous opacity; and the turbid state of the humours.

These changes explain the imperfect state of vision in most cases; while in others, the individual is so blind that he cannot even distinguish light from darkness. During the progress of iritis the constitution is very differently affected. In some cases it is attended with severe febrile symptoms; the pulse is strong and full, the tongue white, with thirst, loss of appetite, and costiveness.

In treating this disease free depletion, both general and local is often required, and this evacuation is to be repeated according to the severity of the symptoms. Tartar Emetic, in nauseating doses, will likewise be used with advantage. Calomel, opium, and hyoscyamus must be given two or three times a day, to affect the mouth as soon as possible; which must be kept up for some time, when the symptoms will rapidly yield; the zone of red vessels disappears, the aqueous humour and cornea become clear, and the secreted lymph is absorbed. Ipecacuanha acts very favourably in these cases, by diminishing the velocity and force of the heart's action, and by affecting the whole vascular system. In doses of four grains it occasions the same sickness, as when it is taken in twelve grains. The large dose, however, acts most favourably on the disease, than when exhibited in small doses. With these remedies a mixture of the

extract of belladona and comphor is to be applied over the eyelids, morning and evening, to keep the pupil distended. The bowels are to be kept open throughout the treatment by aperient medicines, the patient is to be kept in a cool and dark chamber, and his diet is to be liquid and farinacious.

In most cases of iritis, it is only on the establishment of the feverish state, produced by the action of mercury on the system, that the symptoms yield; and as this mineral debilitates so much the constitution, it should be as sparingly used as can with propriety be done. Mr. H. Charmichael recommends, when mercury and the strictest antiphlogistic regimen had failed, dram doses, three times a day, of the spirit of Turpentine in emulsion. This dose may be increased. I have tried it in several cases, but it was not followed by the improvement in the symptoms which I had expected.

The following is the course of a favourable case of Iritis in both eyes, of twelve days' standing:—

The inflammation occurred after an attack of natural small-pox. The red ariola was intense, and well defined; the darkened appearance of the iris, and dull muddy alteration of the cornea were well marked, with irregularity of the pupil. This however, contracted slightly on allowing a stream of light to fall upon the eye. The pain of the head, and eye was very considerable. I applied twelve leeches to the eye, gave a dose of calomel and jalap, with calomel and opium twice a day to affect the system speedily. Fomentations and the extract of belladona and camphor were applied around the eye.

31st.—The inflammation rapidly diminishing, the pupil enlarged and becoming more sensible; no pain: mouth slightly sore. Calomel and opium at bed-time. Lotion of the nitrate of silver.

June 6th.—Sees with both eyes; inflammation gone. The calomel and opium to be left off; continue the nitrate of silver drops. To take aperient pills occasionally.

9th.—Nearly well, weak.

12th.—Quite well, left the Hospital.

Symptomatic Iritis.

When the constitution is enfeebled or diseased, the person is liable to have an attack of Iritis on exposure to the usual exciting causes, and in this variety attention should be paid to the constitutional treatment. When this is not sufficiently observed the disease becomes worse; or sometimes it becomes chronic, the organs are much debilitated, and the cure so imperfect that relapses are frequent.

This variety of Iritis usually occurs with inflammation of the deep-seated tunics of the eye. In this state the sclerotica is red, and the cornea dull, from participating in the inflammation. The inflammation of the sclerotic coat is particularly evident, from its redness, and the straight course of the vessels; while those producing inflamed conjunctiva are tortuous. The iris becomes dull and dark, and the pupil is contracted, with a deposit of lymph on its edges, with which it adheres at different parts to the capsule of the crystalline lens. There are also in these cases feverishness, pain in the eye, and intolerance of light. Such cases of inflammation are unfrequently accompanied with Hypopium.

In all these cases the treatment should consist in the application of leeches, and the exhibition of purgatives, calomel and antimonials, followed by tonics, and by counter-irritants, to reduce the inflammation. The hydrargyrum cum creta is the

mildest and most elegible form, when we fear that calomel may disagree. The extract of belladona should be applied round the eye to distend the pupil, and to prevent adhesions to the capsule of the crystalline lens, and the admission of a very moderate degree of light to prevent irritation. For the same reason the diet of the patient should be cooling and easily digested, without the admixture of stimulants.

After the acute symptoms of inflammation of the iris have subsided, it often happens that the eye remains weak, irritable, and painful on exposure to strong light; and attempts to use it bring on pain. On examining the organ a slight redness may be occasionally seen round the cornea, particularly of the lower half; and the iris is more contracted than its fellow, and more or less irregular, from its adhesion to the capsule of the lens. In such cases the vinum Opii and counter-irritants will be used with advantage when the eye remains weak, after the other symptoms have disappeared.

Even when the scrofulous diathesis appears to have been the cause of iritis, we should not entirely reject the use of mercury. In such cases this mineral, used with caution, and with auxiliary measures of a strengthening kind, will often be of much use in curing the disease. The eye should be guarded from fatigue, and exposure to the exciting causes, more especially to damp night air. The extract of belladona may be occasionally applied round the eye, and, should at any time redness or pain be considerable, a few leeches, or the rusout ointment may be applied round the eye. Aperient and tonic remedies, such as Plummer's blue pills with other aperients, such as Cheretta and Peruvian bark should be exhibited. The favourable manner in which Mr. Lawrence mentions the iodate of potassium, in

doses of three or four grains, in two or three ounces of compound decoction of Sarsaparilla, two or three times a day, in those cases in which mercury has not been found to answer induces me to recommend it in such cases.* The diet should be nourishing and easily digested, with the avoidance of wine, beer, and articles that are of a heating nature.

In this country, where the present is alone considered, and where ignorance and sloth often prevent the native from applying for assistance until the loss of vision, and the means of supporting themselves compel them to apply for assistance; it is then too often found, after the ineffectual trial of the influence of mercury in removing the collections of lymph which prevent vision, the only alternative of the patients is to submit to the operation of forming an *artificial pupil*, the description of which will be given in the 4th Chapter.

Specific Iritis.

This variety presents all the characteristic symptoms of accidental iritis; but differs from it by being of a more remittent nature. In some cases it suddenly disappears; and as suddenly returns as a paroxysm of gout, or rheumatism of some of the joints, increases or diminishes.

In such cases the constitutional treatment should be carefully attended to, as the local affection is often of less importance than the disease producing it. The treatment therefore of iritis, as produced by specific causes, differs from the other varieties. The local disease being in general less acute will require less active remedies; and being of a more remittent nature, the paroxysms are often accompanied with an alleviation of a dan-

* See Treatise on the Diseases of the Eye, Second Edition, p. 416.

gerous disease, the treatment of which requires the most assiduous attention of the medical attendant. I have seen cases of this kind in which the paroxysms all terminated with symptoms of gout in the stomach, of which the individual died.

Syphilitic Iritis.

When the body is contaminated with the venereal poison, it is often affected with iritis. This predisposition is increased by exposure to cold, wet, and other external influences, which produce the disease. The improper use of mercury, by dibilitating the body, and rendering it more subject to disease, seems to increase the susceptibility to iritis. In most cases it is during the treatment for the primary sores, and in others it is during the treatment with mercury, and before the system is affected, that iritis appears, probably from the system, in this state, being more readily effected by exposure to cold and wet. The symptoms are much the same as in other forms of iritis. The tubercular depositions of lymph rather than of pus, the reddish brown pupillary margin of the iris, the nocturnal exacerbations of pain, and the previous occurrence of syphilis sufficiently distinguish this form of iritis.

Arthritic Iritis.

This disease is characterized by occurring in the rheumatic, and the gouty. The person first feels uneasy sensations in the forehead and orbit, extending to the side of the head. There is the red zone round the cornea, but it is more livid, and does not advance to its very edge. A narrow white ring is left between the cornea and sclerotic coat. The pain of the eye and head is considerable, with intolerance of light, lachrymation, and

feverish disturbance. The iris becomes dull and discoloured the pupil contracted, but preserves its central situation. In this variety the deposit of lymph is white, and the pupil adheres more uniformly to the capsule of the lens than in syphilitic Iritis. The attacks are often very violent, but do not last, and the person generally recovers his sight; but, he is subject to frequent relapses, and a fresh effusion of lymph diminishes, and, after frequent attacks, often entirely destroys vision.

It is, therefore, of importance to act energetically to remove the violent symptoms, and continue the treatment so as to prevent relapses. These cases often require venesection and leeches, and other suitable antiphlogistic remedies. When the individual is old, and reduced by frequent attacks of gout the local abstraction of blood will be sufficient, when the feverish symptoms are not severe. Colchicum combined with purgatives will be of great use. In this disease mercury should only be used as a purgative in combination with antimony; after the bowels have been evacuated, and the feverish symptoms diminished, alternative doses of mercury, such as Plummer's Pill, with mild aperients once or twice a day, counter-irritation with blisters, and tepid fomentations will be found of use.

Section 2.

Inflammation of the Choroid Coat, and Glaucoma.

The vascular connection of the Iris and choroid coat explains why the inflammation of the one is connected with that of the other, and when, with the other characteristic symptoms of iritis, there is dulness of the humours, a spasmodic contraction, or a very sluggish motion of the pupil, with an intoler-

ance of light, and a considerable dimness of vision, the choroid coat participates with the iris in the inflammation.

The characteristic symptoms of Choroiditis are pain more or less severe; intolerance of light, lachrymation, pain at the bottom of the eye-ball, which extends backwards, with occasional sparks and flashes of vivid light, followed by impaired vision, and in the severe cases, with total blindness. The pupil in these cases is distended, especially to the side principally affected, and motionless, and the humours are of a lighter and browner colour than natural. I have seen such cases occur in the young, and affect only one eye.

The intimate connection between the choroid membrane and the retina, render it impossible, in some cases, to distinguish the two diseases from each other. When one of these membranes is inflamed, the other must participate in it. In these cases they are generally combined with a morbid alterations in the vitreous humours—the hyloid membrane, and the lens and its capsule, producing the disease called *Glaucoma*.

In the progress of this disease the choroid coat loses its pigmentum nigrum, the retina becomes disorganized, the vitreous humour appears fluid, by the disappearance of the hyloid membrane, and of a yellowish or greenish hue. The lens assumes a gray or amber colour, and is pushed forward through the enlarged pupil so that the iris is in contact with the cornea. In other cases it is dislocated, and sinks in the vitreous humour.

The disease commences with weakness of sight, pain over the brow and across the forehead, with a greenish colour of the dilated, often oval-shaped pupil. This appears more intense when looking directly into the bottom of the eye, which has a

bright metalic lustre, with a gradually increasing dimness of sight. The iris becomes more and more sluggish, as vision becomes more indistinct, and at last, when the disease is advanced, it is quite motionless, and vision is entirely lost. When it occurs in one eye, it often attacks the other; at this time the greenish appearance of the eye becomes more marked. The lens in other cases becomes of a gray colour like an incipient cataract, and I have known operations performed to remove the supposed cataract, without any good effect. In such cases I have noticed the pupil of the usual black colour, and amaurotic. The appearances which indicate these cases on a minute examination of the eye are, a greenish appearance behind the crystalline lens, which is not visible in looking at the eye laterally, the distended and immovable iris, the deadened silvery appearance of the cornea, without the usual glistening appearance of the cornea. In these cases the patient sees best in a strong light. At other times it is of a yellowish green or amber colour, with large tortuous vessels on the sclerotic coat. The pain which had been diminished for some time now ceases, or only returns in a slight degree at intervals (See Plate I. Figs. 2 and 3).

In general the inflammation is of a chronic nature; but in other cases it is more acute, being accompanied with intolerance of light, and continued pain both of the globe and forehead.

This disease is of very frequent occurrence in Bengal, among those who have passed the middle period of life. The unhealthy climate, the bad habit of body, the frequent irregularities in an arthritic diathesis, and dissipated habits, and the exposure to the influence of a burning sun, seem to act in producing the disposition to the attacks of Glaucoma.

In this disease the Prognosis must be very guarded, as the disease is perhaps never cured; and even when in the primary stage, and in the most favourable circumstances, it may be arrested for a time, it generally recurs.

In the insipient stage leeches, counter-irritants, particularly the Tartar emetic ointment, a seaton in the temple, and calomel and opium, with light and nourishing diet should be used. The patient's bowels should be kept regular, he should be kept in a moderate light, and breathe a dry and temperate air.

In the fully developed stage of the disease, when the pupil is green, the cataract formed and the iris motionless, it is incurable. In such cases the distressing symptoms can only be palliated, as they arise, by the usual means.

As an example of the course of the acute form of glaucoma the following case is related :—

Case.—Shaik Hussain from Purnea, aged 20, was admitted into Hospital in consequence of the complete loss of sight of the right eye, and partial loss of the left. The right eye was attacked with severe pain, and is now completely disorganized, being composed of the cornea, sclerotic coat and iris, with the humours reduced to a clear secretion. The left eye was prominent, the vitreous humour greenish, the iris much dilated, and immovable, and the crystalline lens dislocated. He saw very little with this eye, and complained much of the very severe pain in the globe, and in the head. Applied six leeches, administered a purgative, and calomel and opium twice a day.

29*th.*—Pain continues very severe, preventing sleep. The leeches were repeated, a blister was applied to the nape of the neck, and the calomel and opium was continued.

31*st.*—The pain much the same, and a grain of strychnia was added to each dose of calomel and opium.

June 2d.—The mouth sore, and the severe pain has suddenly ceased. The mercury to be given once a day.

5th.—Continues free from pain, and he now seems much better.

6th.—He left the Hospital without leave. The disorganization in the right eye of this patient appears to be a morbid degeneration of the different parts of the eye, from inflammation of the internal membranes.

Re-admitted into the hospital on the 19th July. The right eye of a yellowish green, and vision completely lost. The left eye rapidly disorganizing. The globe distended, the pupil greatly enlarged, and the crystalline lens pushed out of its place, dislocated, and filling up the pupil. He can merely distinguish light from darkness. The intolerance of light and the pain nearly gone.

Case.—Fyjun, a Musalmán woman, applied to the Eye Infirmary three or four years ago, with inflammation of the internal tunics of the right eye, for which the usual remedies were used with success: her mouth was affected with mercury, and blisters, leeches, &c. were used in consequence of severe head-ache. Her vision was not very clear, and she had frequent attacks of inflammation, and the eye became disorganized. She returned to the Infirmary in May, 1842 quite blind, with an oval pupil, and the lens of a yellowish colour. The iris was immovable.

This appears to be a good example of Glaucoma, exhibiting the oval pupil, which the German occulists consider so characteristic of this disease. It also commenced with severe and intermittent pain over the eyebrow and darting across the forehead. This was followed by an increased diminution of vision,

with a greenish colour deep in the eye, which is seen on viewing it laterally. (See Plate I. Fig. 2.)

Section III.

Inflammations aud other diseases of the retina.

Retinitis.—The connection of the retina with the other internal tissues of the eye has already been noticed. The inflammation of the sclerotic, iris, and coroid coats will extend more or less to the retina. When primarily affected, the disease of the retina will extend to the vitrious humour, lens, and parts nourished by the central artery of the retina. In other cases Retinitis will extend to the choroid, iris, sclerotica, cornea, and the conjunctiva. Such a combination seems to be more or less present in the inflammation of the retina, and as this membrane is only sensible to light, it does not produce pain; but as other neighbouring tissues are invariably affected at the same time more or less pain is the consequence. The first symptom of imflammation of the retiua is a tension of the eye-ball, followed by a deep-seated pulsating pain affecting the globe, and extending to the eye-brow, and craneum; which is usually produced by undue exercise of the eye in examining minute objects, by exposure to great heat, or very brilliant objects, &c. The iris is at first contracted and afterwards enlarged, very sluggish, and the pupil contracts and looses its black colour, vision becomes indistinct, sensibility is increased, while fiery spectra appear from the morbid circulation of the blood in the part. The iris becomes greenish or reddish, and appears to be pushed forward; and the sclerotica and conjunctiva become red, with severe fever, and intense head-ache. These may

diminish by the use of medicines or naturally, and the globe is left in a state of atrophy. In other cases the pain becomes less severe, and more remittent, with a feeling of weight and cold. This is succeeded by shivering, when pus sometimes appears at the bottom of the anterior chamber. This increases and fills the chamber, and may be evacuated by ulceration through the cornea or the sclerotica. In other cases the disease terminates in amaurotic blindness.

In the treatment of this dangerous disease complete rest of the eyes, in a cool and dark room should be enjoined, with abstinence and active general and local depletion, followed by the rapid introduction of calomel into the system. This plan of treatment is particularly necessary in the first stage, along with the application of the extract of belladonna round the eye. Counter-irritants will also be found of use with fomentations, and the spirit of opium in drops should be applied when the eye is flaccid, and the person weak; opium and bark will also be of use. When the hydrophthalmia is considerable it should be let out by an incision near the margin of the cornea.

The following case is related as an example of Retinitis produced by exposure to greater heat and glare of the tropical ocean, and producing such weakness of the retina that objects become very indistinct.

Case. Mr. Mitchell, aged 40, had been employed for several years as Pilot in the straits of Malacca, and on several occasions had been employed in piloting boats in search of Pirates, which infested these seas. On these occasions he was often much exposed to great heat, and to the fierce glare of the sun from the still water. This caused head-ache, which was followed by a gradual diminution of vision. For this he had been

bled freely, and mercury had been given to affect his mouth, without any benefit. He seemed to get worse under the treatment, and proceeded to Calcutta. When I first saw him he could only distinguish objects very faintly. The pupils were of the natural size, and were very sluggish in their movements. His general health was much impaired; he was palid, nervous, and much debilitated, with a small weak pulse, upwards of a hundred in a minute. He was enjoined to remain in a darkened room to live on light and nourishing food, without wine or spirits: to take aperient medicine, occasionally at night, with senna-mixture, and the tincture of digitalis, in the morning as required. Strichnine, with counter-irritants, particularly over the course of the 7th pair of nerves, with the application of the Spt. Tinc. of opium to the eye. The general health improved under this treatment, but after a trial of several weeks the sight remained much the same, and after trying other remedies with only partial relief he returned to Europe, as affording the only chance of a recovery.

Section IV.

Amaurosis.

By amaurosis is meant the partial or total loss of vision, which may be complete or incomplete, continual or periodical; and is characterized by the following symptoms: the more or less complete loss of sight, with the pupil generally dilated, and sluggish or immovable. When one eye is alone affected the pupil remains dilated, while that of the other eye changes with the degree of light it receives. The eyes do not act in harmony, and there is more or less of a star-

ing appearance, or of stratismus, with a vacant expression of countenance. The cause and nature of this disease differ so much in the symptoms and progress in different cases, require so different remedies according to the cause, and the eye sight is of such consequence to the happiness and welfare of the individual, that I shall consider each of the classes of causes under the head of accidental, symptomatic, and specific. This will afford the most legitimate means of arriving at the most natural, and most successful plan of treatment in each particular case.

a. *Accidental causes of Amaurosis.*

These causes are either tonic or atonic, or are produced by injuries.

1. *Tonic causes of Amaurosis.*

Such cases may be produced by an inflammatory, or congestive state of the vessels of the retina. In this case the failing of sight usually commences slowly with severe head-ache, and is first observed to recur occasionally, and then periodically. Objects at first appear indistinct, more or less deformed, and then vision becomes obscured by a clouded network. In other cases vision becomes interrupted, the eye misses letters and words, and after reading for sometime the letters become confused. In this variety the person often shades his eyes, is annoyed by head-aches, by spectra, by flashes or streaks of light, by cobwebs, motes, &c. in the eye. All these symptoms are increased by exerting the eye, and by causes accelerating the circulation. In general the disease advances progressively to the total loss of sight, when the dark pupil often becomes of a more palid colour, from the thickened and morbid change in the structure of the retina.

In this the most common variety of amaurosis a strictly antiphlogistic plan of treatment should be followed. When the local or general bleeding with purgatives and sudorifics, has been carried sufficiently far, mercury should be given to affect the system and thus equalize the circulation.

2. *Atonic causes of Amaurosis.*

The following case explains the manner in which debility acts in producing a loss of sight. Dr. Gooch was called to the assistance of a lady who flooded to death. "When I entered the chamber," continued that able physician, "she had no pulse, and she was tossing about in that restless state, which is so fatal a sign in these terrific cases. She could still speak, and asked whether I was come, (she knew I had been sent for) and said, 'Am I in any danger?—How dark the room is? I can't see.' The shutters were open, the blinds up, and the light from the window facing the bed fell strong on her face. I had the curiosity to lift the lid, and observed the state of the eye; the pupil was completely dilated, and perfectly motionless, though the light fell strong upon it. Who can doubt that here the insensibility of the retina depended on the deficiency of its circulation?"

The same effect is produced, though more slowly, by the debility caused by the poor and indigestible food of the natives, particularly when combined with other privations. In such cases the person first notices his vision becoming weak until he can only see during the bright light of the sun, and at last he became quite blind. As numbers are often exposed to these exciting causes, such an affection of the eyes sometimes takes on an epidemic form. Thus Lascars, or native seamen, who

often live on food of a slightly nourishing nature, and are exposed to the weather and great transitions of temperature, in small uncomfortable ships, are not unfrequently affected in this manner. Numerous cases of the same disease appeared among the sepoys in the expedition to Java, in consequence of their being fed on rice alone. The Lascars are so well aware of this that they complain loudly when their diet is confined to rice, " because, it makes them blind." By these causes such a weakness of the retina is produced that objects become indistinct, as soon as the sun disappears, as less of the stimulus of light is present than is necessary in the blunted state of the retina for distinct vision. This forms the disease called Hemeralopia.* The symptoms of the disease are a gradual indistinctness of vision at sunset, when objects appear covered with an ash-coloured veil. This continues for one or two days, to weeks, or months; and after one attack the individual is liable to relapses, during which the sight becomes dimmer as the twilight advances, until vision is completely lost.

When the eyes are examined the pupil are found dilated and the iris sluggish, and often immovable. There is no pain in the eye. At first the person can see indistinctly in candle or moon light. If neglected the sight becomes gradually weaker during the day, and may terminate in amaurosis. The disease is produced by an exhaustion of the retina by its exposure to light under particular circumstances, which can usually be removed by following a proper plan of treatment. The treatment in Europe consists of local bleeding, the repeated appli-

* I use this term to designate " Night Blindness," as generally adopted, although not the correct term. Nyctilopia, " Day Blindness," I consider as merely a symptom, and as such I shall consider it.

cation of blisters to the temples, and behind the ears, with purgatives. In tropical climates, it consists of improving the tone of the system by the use of tonics, aperients, and nourishing diet; and attention to the cure of any disease which may accompany, and accelerate the disease of the eye.

When the paralysis of the nerves of sight, which produces this disease intermits, quinine during the intervals, will be found an excellent remedy, to diminish or check the disease.

The following is an example of the manner in which this disease becomes epidemic in certain situations. In September 1838, three hundred and fifty followers of a person pretending to be the Rajah of Burdwan, were incarcerated in the jail of Hooghly, until the judicial examination of their case was completed. These prisoners consisted of up-country men, often rather selected from the being such, than from their physical powers. Many were old, others very young; and a third class dibilitated. These people had been accustomed to live on a full diet of butter, bread, &c. and seemed to have been deluded by having prospects of advancement held out to them. While they were with the pretended Rajah, they were obliged to remain contented with a small portion of their pay, which did not admit of their obtaining their accustomed necessaries of life. In this state they were suddenly seized, and placed in confinement. In jail they were put upon the usual allowance of two pice a day, which was not sufficient to procure them their accustomed food. The depressing circumstances of their incarceration, and the influence of the unhealthy season of the year, quickly showed itself, and three months after became more evident, when they found the chance of liberty and reward more distant and uncertain.

At this time nearly all the above prisoners became more or less affected with Hemeralopia; many of them could not see clearly during the day, and as soon as the sun set, and light diminished they became completely blind until the bright sun of the next morning stimulated sufficiently the retina to action. The light of candles, and of the moon, was insufficient to enable them to see. Their pupils were dilated, the retina pallid, and the iris sluggish. In all these cases a generous diet with aperients and tonics quickly restored their vision, and an improved scale of allowance quickly stopped the disease in the jail. Dysentery appeared, with hot skin, quick pulse, and white tongue followed by œdematous swellings of the extremities, and great dibility. Their ears became painful and discharged pus. The conjunctiva next became of a pinkish redness especially round the cornea; and the eye became very painful, and sensible to light. The cornea was dull and irregular in its surface, followed by ulceration round its edge. (See specific inflammation of the Globe of the eye.) These changed to a yellowish, and pulpy slough. The complications in some of these cases of hemeralopia, were as follows:

	age.	Complication of Diseases.	
Chundee Churn Gosaul	58	Dysentery	Hemeralopia.
Goolzar Singh	43	Dysentery	do
Gunput Laul..................	45	Do œdema	do
Shawho Dewan Singh.	39	Dysentery	do
Reetoo Singh	45	do	do
Ozoodiha Singh	60	do	do
Bhobison	40	do	do
Meer Nur Ali	40	do	do
Deen Dyal	45	do	do
Gobheer Singh	35	do	do
Kooblal Singh	40	do	do
Bhakha	36	Rheumatism	do
Ramessur Chukerberty	33	Sores	do
Takeera Rahuman	23	Dysentery	do
Khumdeh Singh	60	Leprosy	do
Sagewan......................	36	Dysentery	do

On another occasion, during a tedious voyage from Dacca to Calcutta, there were several of the crew that complained of hemeralopia on our return. One was a bearer whose pay did not commence till he reached Dacca, and a second was so lazy that he would not work as the others did, in consequence of which neither were allowed the same quantity of food, and both became weak and affected by hemeralopia. The season was cool, but the sun was very hot, and the glare from the calm surface of the river was considerable, to which they were exposed during the day. Both complained of pain in the head, and round the orbit, and one of them at times had a considerable degree of redness of the conjunctiva. In both the pulse was weak; in one of them it was 94, soft, and easily compressed. The iris in both was sluggish during the day, when the pupil was larger than usual, and at night it was fully distended, and immovable. The retina had a lighter or grayish colour. During the day vision

was less distinct than usual, and as twilight advanced, although the pupil enlarged considerably, vision was very imperfect. Objects appeared to be enveloped in a haze, and this increased as darkness advanced until vision was entirely lost.

Another class of causes producing this loss of sight is the frequent use of magnifying or telescopic glasses, the accumulation of the humours of the eye, or by such causes as exhaust sensibility, as by frequently viewing minute or brilliant objects, exposure to strong light, to the sudden transition from darkness to light, as that of the sun, lightning, &c.

It was by this means that the cruel tyrants of Asia destroyed vision, by placing a red hot ball before the eyes of their victims; which destroyed vision, by the complete amaurotic state it produced.

The treatment in this variety is sufficiently simple. It should consist in avoiding the exciting causes, in using nourishing food with tonics such as the preparations of bark, with stimulants to the eyes, as the Vin. Opii Spt., the vapour of the liquor ammonia; with frictions to the eyebrows, stimulating lineaments, blisters, errhines, electricity, &c. These external irritants are particularly useful when the disease is caused by the exposure to a great glare of light. Hydrocyanic acid continued for sometime, will sometimes gradually restore the sight.* Creasote in doses of two drops increased to 20, if necessary, three times a day, will often be of use. In some cases the application of leeches and emetics will be found to afford relief, when the symptoms of congestion, and derangement of the stomach are

* See Dr. Bamfield's Essay on Medical and Chirurgical Transactions, vol. 5.

present. The restoration of the usual discharges, as of the cataminia, by the application of leeches, &c. will be found of great use.

Sometimes persons are found in this country who are unable to judge of colours, although their sight is good in other respects. This appears to be a congenital affection proceeding from a defect of the brain, rather than of any of the parts composing the eye-ball.

3d. *Injuries producing Amaurosis.*

The brain, or that part of the optic nerve lying within the cranium, by participating in the diseases of the former, is a frequent cause of amaurosis. In other cases the inflammatory softening of the brain, extravasation of blood, the pressure of tumours upon the nerves, hydrocephalus, injuries of the head, &c. produce the disease. Another class of causes is in the use of those nerves connected with the eye, though not immediately subservient to vision, which affect the retina secondarily.

The treatment in this class must be regulatsd by the same principles as the treatment of the other varieties, which will vary in each particular case, and must be left to the judgment and experience of the practitioner.

b. *Sympathetic causes of Amaurosis.*

Amaurosis is not unfrequently produced by a state of irritation of distant organs, which effect the optic nerve through its connexion with other nerves. Such cases of amaurosis occasionally occur, as we have already seen, from general debility, from the irritation of worms in the intestinal canal, from intemperate habits, from deficient or irregular uterine action,

from hysterical affections, or the temporary failure of sight during a billious attack, indigestion, &c. This form of amaurosis is not necessarily, or even usually connected with, or attended by intolerance of light. In other cases the intolerance of light is well marked. The amaurosis may be preceded, or followed by the manifestations of the peculiar diathesis producing it. The symptoms in this form of amaurosis vary with the state of the system, which also modifies the amaurosis. In some cases the attack is sudden and accompanied with symptoms of vascular congestion. Such as head-ache, and clavus over the brow; heaviness, tending to sleep, with mental and bodily lassitude. The face is flushed, and the carotids pulsate morbidly. In some cases of sympathetic amaurosis the blindness comes on gradually, shows itself in one eye, is attended with a contracted pupil, and intolerance of light. In these cases the patient often complains of nausea, irregular appetite, chilliness, and pain in the occipital region. These symptoms accompany the cause of the amaurotic symptoms; in other cases the disease is more chronic, and the symptoms less marked. In this variety of amaurosis both eyes are usually affected.

The indication to be followed in the treatment of this form of amaurosis are,—

1*st*. To remove the derangement of functions of the organs, which calls the constitutional disorder into activity.

2*d*. To correct the general state of the nervous system, and that of the eye in particular.

The first indication is usually fulfilled by a calomel purge to clear the bowels and restore the healthy secretions; followed by such medicines as act on the disease which accompanies the amaurosis, such as Spirit Ammon. fœt. Decoct. Aloes, Comp.

&c. The body is to be attended to, so as to restore it to its healthy state; in some cases by bleeding, in others by tonics, cold bathing, frictions, moderate exercise in cool and pure air. Anti-spasmodics are also of use, with the exclusion of light, quietness, warm or cold applications, &c. according to the patient's feelings. Leeches, and blisters to the back of the neck will also be of use.

c. *Specific causes of Amaurosis.*

Under this head will be considered those helpless cases of amaurosis which are produced by causes inducing a paralysis of the retina. Among these will likewise be arranged the cases of amaurosis produced by sudden shocks from blows, from the poison of lead, &c. In these cases the symptoms and means of relief are the same as those already enumerated.

General Treatment of Amaurosis.—In considering the different varieties of amaurosis I have stated the treatment more particularly adapted for each of these. I shall now add a few remarks on the treatment in general, particularly on the more aggravated forms of this most distressing disease.

From the different and opposite nature of the causes which produce amaurosis, the same treatment will not be proper in all cases. Our prognosis, although it should always be most guarded, will vary with the cause producing it. These have been already stated, and it should be recollected that much of the success of the measures to be pursued will depend upon the early period of the disease at which they are commenced; and that little or no hope of amendment can be held out to the patient with confirmed amaurosis, or *gutta serena.*

There are always many cases in which the disease does not

yield to the best directed plan of treatment. For instance when the disease has existed for several years, in persons advanced in age, and whose sight has been weak from youth. When the disease has slowly formed, commencing with pain in the head, followed by a gradual diminution of perception in the organ to complete blindness; when the pupil has an unequal or fringe-like margin; when preceded by paralysis, with a general dibility and languor of the whole constitution from debauchery, or from the abuse of spirituous liquors; when produced by premature or excessive venery, severe internal inflammation of the eye, followed by a pale appearance in the bottom of the eye; when caused by severe blows and contusions of the eye or its neighbouring parts; or by exostosis within the orbit, the cure is always difficult. In other cases relief is only obtained for a time, by the disease being arrested in its course. These are the cases of incipient amaurosis which occurs suddenly, and only affect one eye, or both eyes partially. In such cases the disease is only functional.

The apathy of the natives, their manner of living, their dissipated habits, and being exposed to the sun, render them very subject to the worst form of amaurosis in which medicines are of little use. On taking possession of the Eye Infirmary many of these organic cases presented themselves in hope of being benefited by a new practice; I did not prevent their admission, and I tried various means without the desired effect, and one by one they left the hospital believing that God had willed it, or in the beautiful lines of Milton in his address to light. Paradise Lost, B. III. 22 :—

——————— "But thou
Revisit'st not these eyes, that roll in vain

> To find thy piercing ray, and find no dawn;
> So thick a drop serene hath quench'd their orbs,
> Or dim suffusion veil'd."

I have however tried different means in these cases of complete gutta serena, and must conclude, as far as my experience has yet advanced with Maître-Jean " c'est rechercher la pierre philosophale, que de vouloir chercher des remèdes pour guérir la goutte sereine; cette maladie est absolument incurable."*

CHAPTER III.

Diseases of the Humours, and of the Globe of the Eye.

These diseases will be considered under the heads of disease of the aqueous and vitrious humours, and of their membranes; and of the crystalline lens, and its capsule.

Section I.

Diseases of the Aqueous Humour, and its membrane.

The membrane which lines the internal surface of the cornea, and passes over, though much modified, the anterior surface of the iris, is generally considered as serous; and upon it the quantity and quality of the aqueous humour depends. It may be attacked with inflammation, which is accompanied with redness of the sclerotica and conjunctiva, which often terminates in whitish opacities of the cornea. This dim and opaque appearance of the lining membrane may be observed, while the

* Des Maladies de l'Oeil, p. 253.

external surface of the cornea is perfectly clear. There is also muddiness in the anterior chamber, which appears prominent, with a sensation of distention; and sometimes an increased secretion of tears, with a slight intolerance to light. The pain is generally dull and aching, in the forehead or back part of the head; but in other cases the pain is severe, pulsative, and nocturnal. There is usually feverishness, with the severer forms of the disease; such as frequent and hard pulse, hot and dry skin, tongue loaded, and functions of the alimentary canal disordered. The effusion of lymph upon the lining membrane may become organized, and a permanent diminution, or loss of vision is the consequence.

In the acute stage of this disease depletion, calomel, and belladonna, are the principal remedies, with calomel and antimony in small and repeated doses, and purgatives. Stimulants should be applied to the eye after the acute stage has passed; such as opium wine, and quinine internally.

Case. Hunnuman, æt. 25, was admitted into the Jail hospital on account of pain of the eyes, and inability to see at night. The cornea were quite smooth and clear externally; but was so obscure and muddy within, that the pupil could be seen with difficulty .The conjunctiva was dry, and many deep vessels were seen passing along the surface of the sclerotica. As the disease advanced the pain of the eye increased, vision became more indistinct, and the eyes became so susceptible of light that their state could be seen with difficulty. Calomel purges, leeches, and blisters were the remedies employed with success in this case.

The *aqueous humour* is sometimes increased in quantity forming what is called *Hydrophthalmia*. In this disease the cornea is distended and prominent, the pupil dilated, and the iris slug-

gish, with indistinct vision. In other cases the spheroidal distention of the cornea is greater, and it becomes discoloured with fasciculi of red vessels on its surface. The aqueous humour is increased, and rendered muddy by inflammation of the iris, and choroid coat. In this disease the aqueous humour may be evacuated as a palliation remedy, and counter-irritants applied to the neighbourhood of the eye.

The inflammation of the capsule of the anterior chamber sometimes terminates in suppuration. This is called *hypopyon*, and there is a true and a spurious form ; the first being caused by the secretion of the inflamed membrane, and the spurious by an abscess in the substance of the cornea or iris, which bursts, and evacuates its contents into the anterior chamber. The treatment of this case should be of the same antiphlogistic nature, as has been already explained in the treatment of inflammation of the lining membrane.

Section II

Diseases of the Vitreous Humour, and its membrane.

The vitreous humour is formed almost entirely of water, and with the thin delicate sacculated membrane, which contains it, is perfectly transparent in its healthy state. This delicate hyaloid membrane may inflame, and portions of it may become opaque. In other cases the humour becomes discoloured in such cases, or in the course of iritis, or diseases of neighbouring parts. In other cases the vitreous humour is changed in consistence and transparency, being converted into an opaque substance, resembling curd ; in one case it was like boiled rice.*

* See Traver's Synopsis, p. 206.

Sir William Adams says, " In those cases which I have seen it was in one of a pea-green colour; in another of a yellowish hue, resembling amber; and in the third of a dark brown colour like porter. In all, the vitreous humour was as fluid as water."*

In some cases there is a dissolution of the vitreous humour with a disorganization of the hyaloid membrane. This is the case in floating cataracts, in tremulous iris, &c. These changes are accompanied by preternatural fluidity, or boggy state of the globe of the eye. This not unfrequently occurs after operations, and in the course of severe inflammation, in bad constitutions, by the absorption of the vitreous humour. In other cases a dropsy of the vitreous humour occurs, which will be considered in the next chapter.

Disease of the Crystalline lens, and capsule.

Cataracts may be produced either by opacity of the lens, of the anterior or posterior capsule of the lens, or by a morbid alteration in the fluid, between the lens and capsule, which is usually called the liquor morgagni.

The general causes of cataracts are very obscure. They usually occur spontaneouly. In some cases, however, the cause is a wound of the capsule or lens, inflammation, &c. Much exposure to a glare of light, immoderate exertion of the eye, and old age, predispose to cataracts. The state of the infant eye gives a like tendency.

The *symptoms* of a cataract are usually sufficiently evident. The patient first observes a defect in vision, and objects appear obscure, so as to require a strong light to see them plainly. The obscurity increases, and the person sees better in a mode-

* Treatise on Artificial Pupil, page 116; Note.

rate, than in a strong light. On examining the eye an opacity appears in the centre, and behind the pupil. This gradually enlarges, and the sight becomes more dim; particularly in regarding objects in front of the eye.

In the capsular cataract the central point is less evident, the opacity is more diffuse, and is sometimes immediately behind, or appears deeper situated, and the obscurity is not so much affected by the difference in the degree of light, or by the position of the objects, as in a healthy eye.

Cataracts sometimes form in infancy, in youth very seldom, and as age increase they are more common until old age, when they most frequently occur. The lenticular cataracts are either hard, soft, or milky; and the capsular only vary in their toughness, or friability. These varieties may be distinguished by the following peculiarities:

1. The *Hard Cataract* commences generally in old age with an opacity in the centre of the lens, which slowly increases as the sight diminishes, and has a yellow, dark, amber colour. The lens shrinks, and the space between the iris and the opacity is considerable, while the pupil remains sensible to light.

2. The *Soft Cataract* is known by its being of the consistence of jelly, with a hard centre. This opacity is uniform, and the lens appears enlarged, so that it pushes forward the iris; the sight is completely lost, and the motion of the iris is very sluggish. This cataract often appears to contain spots or streaks.

3. The *Milky Cataract*. This cataract is always more or less fluid, of unequal density, and of a white colour. It has white spots or streaks which change their position with that of the head. The lens is enlarged and globular, filling up the posterior chamber, and pushing forward the iris. The sight is com-

pletely lost, and the pupil remains distended, and is sluggish in its motion.

4. The fourth is the *Capsular* form of cataract. The opacity in this form may exist either in the anterior, or posterior layer of the capsule. In the former case the opacity is not complete, or uniform, but appears superficial and close to the pupil. When the posterior layer is affected, the appearance is deeper, and less evident. In some cases its concavity may be observed with the appearance of radiated lines.

In some cases of these membranous cataracts the lens is absorbed, and a dense tough membranous substance is formed. This is the state in which the *congenital* cataract is often found ; but in the generality of these cases, the lenticular cataracts are soft with a tough opaque capsule, which has a nuclius from which it is unequally opaque, with a streaked or reticulated appearance. This variety of cataract is found to exist at birth, or appears soon after. They seem to be hereditary in some cases.

Treatment. The only means of treating cataract, which has hitherto been discovered, is by an operation, the success of which will depend on various circumstances ; such as :

1. If the loss of sight has been gradual, and in proportion to the extent of the opacity of the lens.

2. If it has been unaccompanied by any pain in the eye, the orbit, the temples, or the back of the head.

3. If the dilatation of the pupil is in proportion to the opacity of the lens ; and if the iris contracts by increasing the light.

4. When the cataract is mature ; that is the opacity complete.

When all, or the greater part of these circumstances are present, the operation may be performed.

When one eye only is effected with cataract, it has been questioned whether an operation should be performed or not, until both are affected; as when the operation is performed when only one eye is affected the foci of the eyes differing, the person will not see with both eyes at the same time. This however is of much less consequence than might at first be supposed, as few individuals use both eyes, particularly when one eye is weaker than the other. But even if both eyes are used, nature may be observed to remedy, in a certain degree, the deficiency. The eye-ball diminishes in size, and the convexity of the cornea increases, so as to place the two eyes in greater equality, and so enable them to act together. A much more powerful argument in favour of performing the operation, when only one eye is affected, is the amaurotic state of the retina which the long want of use is liable to produce. This I am aware has been denied, but analogy, as well as observation, has convinced me that such a weakness of the nerve really takes place, by a long want of use. The following is an example:

Case. Shah Kulee æt. 60, was admitted on the 14th July, 1842, into the Eye Infirmary with cataracts in both eyes. He had good eye-sight till five or six years ago, when the right cataract began to form. The obscurity increased until he lost the sight of the eye completely. The left eye continued strong until four months ago, when a cataract formed, and on admission into hospital he was quite blind. I depressed the right cararact on the 14th July, and the pupil was clear, but he did not see. As the cataract of the other eye was mature, I performed the operation of couching. The pupil was clear, and he

had good vision from this eye, while the pupil of the right continued more dilated than the other, the iris immovable, and vision lost.

I considered the difference in this case to depend on the long period during which the retina remained inactive; and which would have been prevented had an earlier operation been performed.

Operations for Cataract.

When the opacity of the cataract is so complete as to obstruct vision the operation should be performed, although the other cataract may be in an incipient stage, when the person does not retain a sufficient degree of sight to enable him to perform his usual occupations. The reason of this practice I have already stated to be, to avoid the danger of amaurosis following the long want of the use of the nerve. The operation however should not be performed until the cataract is muture, or completely opaque; in order that the patient may use it as long as possible, and to prevent the occurrence of inflammation, which is more liable to follow an operation when performed under other circumstances.

There are two operations which are performed for cataract, the first being depression or couching, and the second extraction. Before considering these operations I shall add a few remarks on the preliminary arrangements. These consist of the state of the body, the instruments, and the position of the patient.

Previous to the operation for cataract it is necessary to inquire as to the state of the patient's health. The bowels should be cleared out, and if the patient be strong and plethoric, he should abstain from animal food and fermented liquors for a few days previous to the operation. No such preparation is

required with the native, but I always give an anodyne mixture after the operation, and another at night, with perhaps leeches if there is pain, followed by a purgative in the morning.

The instruments and bandages required for couching are a needle slightly curved, which is a modification of Scarpa's. The curve being less, the point broader, and the cutting edge extending only to the shoulder with the lower part flat, and the upper or convex side with a slight rising in the middle. It should be long and very gradually increase in diameter to the handle. (See Plate 3, A. B.) There is also required a little oil to cover the needle, by which it will pass with greater ease through the sclerotic coat, a folded piece of cloth, wet with cold water, and a circular bandage. The pupil of the eye to be operated on being previously dilated by the extract of belladonna; the eye which is not to be operated on is to be covered with a bandage, to prevent the sympathetic movements of the other.

The light should be considerable and steady, and should fall obliquely upon the eye to be operated on. The patient should be placed upon a low firm seat, with a perpendicular back, from which should rise a movable perpendicular piece of wood, terminating above in a cross portion of wood, concave above, upon which the head of the patient rests during the operation. This perpendicular piece of wood should be raised or depressed, to suit the height of each patient. An assistant should steady the head, and raise the upper lid by placing his fore-finger upon the edge of the lid, and raising, and pressing it gently against the superciliary edge, taking care not to press upon the eye-ball. The operator should rest on a high seat, so that the patient's head is opposite to his breast, and he should place his legs one on each side of the patient's, so as to steady them.

The needle is to be taken by the operator, and after being oiled, it is to be held between the thumb and fore-finger. The patient is now desired to look inwards towards the nose, and the operator penetrates the sclerotic coat about a line and a half from the juncture of the transparent with the opaque cornea, and a little below the transverse diameter of the eye, with the flat side of the needle horizontal. In this situation the operator does not wound the retina which terminates, and where the ciliary ligament commences. He also avoids the ciliary artery, which passes along the middle of the external convexity of the eye-ball, between the sclerotic and choroid coat. The needle is first to be directed to the centre of the globe of the eye, and then the point is to be carried inwards parallel to the iris until the point is visible through the pupil. The operator is to raise its point, and push the cataract downwards and backwards, taking care nor to depress the needle beyond its horizontal direction. If the lens should rise from its new position in the vitrious humour, it must again be depressed; and when it remains so, the needle is to be withdrawn. If the cataract be large it should be *reclined* so that it may be placed flat, and out of the line of vision.

In congenital cataracts of children, the operation for the solution of the cataract may be performed between the age of eighteen months, and four years; or in the adult, when the cataract is soft, fluid, or membranous. In this case, after the pupil has been well dilated with the extract of belladonna, a needle is to be passed a line from the junction of the cornea with the sclerotic coat, at its lower part; or at the usual place for depressing the cataract, and carried on to the capsule of the lens, which is to be freely opened, and as much of the opaque part as possible removed from the line of vision.

The child, during the operation, should be placed in a recumbent position rolled in a sheet, and the upper eyelid raised by a speculum.

After treatment. A simple fold of linen moisted in cold water is to be put over the eye, and the patient is to be kept in a dark apartment, and the Surgeon is carefully to observe if any pain supervenes. If inflammation occurs, the general or local abstraction of blood, repeated as circumstances seem to require, must not be neglected. When the pain commences an anodyne draught is to be given, or should the patient feel easy it may be deferred till night. If on the contrary considerable pain is felt, a dose of calomel with opium and hyosciamus should be given at night, and a dose of castor oil, or of the compound jalap powder in the morning.

Great care is required to be observed in the after treatment. As long as the eye is covered up, belladonna should be applied round the eye, and should there be symptoms of inflammation, the eyebrow should be cleaned, and the extract applied fresh three times in the course of the day. As soon as the covering is removed from the eye, more care is required in the use of the belladonna. It should not always be employed, as is generally the case; as it allows too much light to fall upon the retina, which has been probably for a long period unaccustomed to any, and this hastens any disposition to, or even produces amaurosis. The frequency of the application of the extract of belladonna should be regulated by the tendency of the eye to inflammation; and when this is frequent, the person should at the same time remain in a dark room. Should no inflammation exist, and the pupil remain contracted, from the sensible state of the retina, the application of the belladona at night on going to bed will be sufficient; and when more frequently required, it should be

with a covering to exclude light from the eye. These remarks are very important, and from their being often neglected in this country, I consider it more necessary to state them here.

In some cases, from the capsule of the cataract not being sufficiently separated, and from its dragging the iris, considerable inflammation and great pain are produced for days after the operation of depression. In such cases a needle is to be introduced, and the attachment of the capsule is to be removed. By these means, even when the inflammation has been considerable at the time, it will be immediately relieved. The following is an example:

Case. Parbotee, æt. 65. was admitted into the Infirmary on the 28th of September, with mature cataract of the right, and insipient of the left eye. The operation for depression was performed, after which an anodyne draft was administered, followed by a dose of castor oil next morning. The mixture of belladonna and camphor was applied round the eye. Next day the pupil was clear, with some pain and inflammation. The inflammation of the internal tunis continued, for which a blister was applied; with the preparation of reswat round the eye, and her bowels were kept open with castor oil.

The pain and redness continued, and on the 5th October a needle was introduced, and the capsule and lens were separated from their attachments, and depressed. Relief was obtained, and a dose of calomel, opium, and henbane was exhibited, with castor oil in the morning. She slept well; and the eye then appeared much less inflamed, and the case went on very satisfactorily to the cure.

Extraction of the cataract, or the removal of the crystalline lens. The patient should not be labouring under any morbid

disease, and should be prepared for the operation by evacuating the bowels, and avoiding stimulating food. The instruments required for this operation are:

1*st*. *A cornea knife*. Beer's knife, which has the upper edge cutting at the point, and straight; the lower edge is cutting and oblique in its direction; while the size of the knife is increased from the point towards the handle, so as to prevent the escape of the aqueous humour.

2*d*. A pair of *curved scissors*, to elongate the opening made into the cornea, if not made sufficiently large, in the first instance.

3*d*. The *curved needle* with the "*curette*" or scoop at the end, to open the capsule of the crystalline lens, and to remove the opaque fragments of the lens.

4*th*. A pair of minute forceps to extract any opaque portion of the membrane, in the line of vision.

After these instruments have been arranged conveniently, the operator is to bind up the eye, not to be operated on, and the patient is to be placed upon the same sort of low chair as in couching, and in such a manner as that a full and clear light should fall upon the eye, more particularly on that part where the point of the knife is to be carried through. The operator is to be placed in front of the patient, on a high and firm chair; the assistant is then to raise the upper eyelid, as in couching; taking care not to make pressure on the globe. The knife is to be held in the same manner as the needle for couching. The point of the knife is then to be entered at the distance of half a line from the anterior juncture of the cornea with the sclerotic coat, a line under the transverse diameter of the eye, and passed in a direction parallel to the iris through the anterior chamber to the

opposite side, so that the point comes out a little above the transverse diameter. The knife should be carried straight onwards, and as soon as the section has been completed the upper lid should be allowed to drop over the eye to prevent the escape of the vetrious humour. The operator should wait until any spasm or unsteady motion is removed, and the eye is quiet. It is then to be gently opened, and if the incision is not sufficient for the passage of the cataract, it is to be enlarged by means of the scissors, so as to enable the cataract to pass through the wound without the necessity of using force. The curved needle is then to be introduced with its convexity under the flat of the cornea; the point turned to the fore-part of the capsule, and it is to be moved in different directions, so as to make a crucial incision. The upper lid is again to be dropped over the eyeball, and gentle pressure is to be made above the globe, so as to lift the lens from its bed, and it passes through the opening of the cornea. The eye is then to be carefully examined, and any fragments of the lens are to be removed by the curette, and any opaque portions of the capsule by the forceps.

A light compress of fine linen wet with cold water is to be applied over the eye, the patient should be carried to bed, and placed in a dark room, with his head a little elevated. Should any pain, or uneasiness of the eye occur with fever, blood should be removed from the arm, or with leeches, according to the circumstances of the case. The evacuation should be repeated if necessary. The patient should be kept in bed, and a bed-pan used for several days, and it is only on the fifth day that he should be allowed to sit up for a little time to have his bed made. For this period, the diet should be light farinaceous food, in small quantities.

Soft and fluid cataracts are to be removed by solution, or opening the capsule, and extracting the opaque matter from behind the pupil.

For firm cataract the operation for depression, reclination, or extraction may be performed, with nearly equal success; but in tropical climates in general, and particularly in Bengal, extraction can very rarely be accomplished, on account of the difficulty with which adhesion of the cornea takes place, and the great additional risk which is consequently run in the eye collapsing after the operation.

CHAPTER IV.

Diseases of the Globe of the Eye.

These will be considered under the heads of accidental, symptomatic, and specific diseases.

Section I.

Accidental diseases of the Globe of the Eye.

From what has been already stated regarding the varieties of inflammation it will be readily understood that the symptomatic, and specific causes of ophthalmia act on analogous tissues. In no case can either of these classes of causes affect at the same time all, or the greater number of tissues of the eye. But although perfectly distinct several of the tissues may be affected at the same time, from their intimate connection with each other. Thus in the disease called *ophthalmitis*, there are pre-

sent all the symptoms of acute conjunctivitis; such as chemosis, intolerance of light, lachrymation, redness and swelling of the palpebræ, and opacity of the cornea. The iris is discoloured, the pupil contracted, deep seated pulsatory pain of the eye, and neighbouring side of the forehead, which increases to delirium, with all the symptoms of acute fever. In some cases the cellular membrane of the eye is distended with effused fluid, and pus forms in the anterior chamber. It is only from the class of accidental causes, or from sympathy, that the globe of the eye may be thus inflamed. Such as, severe injuries after extraction of the cataract, the operation for staphyloma, artificial pupil, &c.; particularly in persons who have suffered from severe diseases of the eye, or who are of a bad habit of body. Such accidents are fortunately of very rare occurrence, as they are the most formidable affections to which the eye is liable. The symptoms will be modified by the degree of injury to which the different tissues have been subjected, and the state and habit of the body. The danger to the destruction of the organ will in the same manner be varied; but in all cases recourse to the early and energetic antiphlogistic means will afford the only chance of saving the eye; which often suppurates or becomes absorbed, when these means have not been used sufficiently early. The free employment of the lancet and the application of leeches, followed by nauseating doses of tartar emetic in one-quarter grain doses, every two or three hours, until the system is sufficiently reduced; and to arrest the internal disease, mercury should be exhibited, to affect the system.

The degree and kind of remedies must be varied with the kind and extent of the injury, and must be left to the experience and judgment of the practitioner.

Inflammation not unfrequently terminates in *suppuration* of the globe, and if much pus is secreted the pain increases rather than diminishes, as in other parts, from the unyielding nature of the tissues, and if not evacuated the person suffers much before ulceration of the cornea and the evacuation of the tissues take place. To abridge this period, the surgeon should make an incission into the cornea so as to divide the iris and celiary ring; and apply anodyine fomentations and administer opium internally, with the repeated application of poultices, both before and after the evacuation of the pus, which will diminish pain, and soothe the system. After the purulent evacuation has taken place, the disorganised eyeball sinks into a small tuberculous swelling. The same shrinking or *atrophy* of the eyeball sometimes occurs after severe and long continued inflammation of particular tissues. A frequent example of this is seen in this country in long neglected encanthes. In such cases the continual friction of the eyelids upon the sensible cornea is followed by inflammation, nebulous opacity, and at length a total loss of sight. The clear sensible cornea becomes white, opaque, and insensible. The conjunctiva is no longer moistened by tears, and becomes thickened and white. The globe of the eye becomes soft, shrinks, and vision is irreparably lost. The same effect is not unfrequently produced after the severer forms of the scrofulous varieties of ophthalmia, and after severe and neglected inflammation of the internal tunics. In some of these cases the cornea remains clear, and the pupil is contracted, and filled up with lymph.

Operations performed upon eyes which are flaccid, and in which the pupil is imperfectly visible, are rarely attended with success.

Section II.

Symptomatic Diseases of the Globe of the Eye.

The remarks which have already been made of the different varieties of Inflammation will prepare the reader to expect that in no case are all the tissues of the eye attacked with inflammation symptomatically. In this variety one tissue is more affected than the others, which sufficiently indicates the importance of the distinction in a practical point of view. The similarity of the tissues of the eyes, and their connection with each other render them subject to the diseases which may affect each other; thus inflammation particularly phlebitis, cataract, and amaurosis, sometimes present examples of this "*consensus occlorum.*" This connection applies more or less to all diseases of the eye, and they do not require a separate consideration. The same treatment is to be pursued in the secondary as in the primary affection of the eye; but when one eye receives a severe mechanical injury which impairs or destroys it, the other eye from its connection, structure, and uses, not unfrequently is attacked five or six weeks after the injury, with most dangerous sympathetic ophthalmia, which if not energetically and judiciously treated will generally terminate, often, after repeated attacks, in the atrophy, or complete amaurosis of the other eye, thus secondarily affected. In such cases the person feels the eye painful with dimness of sight. The zonular redness forms round the cornea, with contraction of the pupil, and adhesion of the iris; insensibility of the retina; greenness of the iris, of the capsule and lens, flexibility of the cornea, and yielding softness of the ball. The pain varies; but in general it is very severe, particularly at night. The pulse is quick, with thirst, and a buffy

coat forms on the blood that has been removed. Such secondary attacks of ophthalmia are more common in weak and diseased habits of body, as with a scrofulous, arthretic, and syphilitic habit of body; and in those who live an irregular, and intemperate life. This is more particularly the case when the eye has been used too soon, or too much after the injury, or after the sympathetic inflammation has been removed, and a relapse occurs.

The treatment to be pursued in these cases is rest, with the use of mercury, and the strickest attention to the antiphlogistic remedies, combined with anodynes. Still these means are often insufficient in saving the sight. Dr. Wardrop recommends the destruction of the eye principally affected in cases in which the loss of both eyes is endangered, as he had observed was done with the best effect in horses which are subject to a similar distinct sympathetic inflammation. In these cases when one eye suppurates and sinks in the orbit, the disease does not attack the other; or subsides if it has commenced in it. In such cases Mr. Barlow opens the cornea, and removes a large flap of it, in order to give vent to any foreign body which may be contained in the eye, and the removal of which is accelerated by the employment of poultices. Immediate relief follows the excission of the cornea, and when the eye is disorganized, it should be employed to abridge the sufferings, and also to save the other eye from inflammation, which is immediately diminished by the above operation.

Intermittent Ophthalmia.

The pain and severity of the symptoms which occur in some varieties of ophthalmiæ are subject to nocturnal exacerbations,

and morning remissions. The disease remits, but in some cases the intervals are more marked and distant, and the paroxysms distinct and regular. In such cases the disease affected one eye which had suffered severely from previous attacks of inflammation, or in individuals whose constitutions were of a scrofulous, or arthritic diathesis. In such cases the redness is of a carmine hue, and affects more or less the conjunctiva, the cornea, and the sclerotica. Dr. Mackenzie has recorded a case of this kind which occurred in a scrofulous young man at regular periods of six or seven days. In this case there was no disease of the iris, and the sight was perfect. These paroxysms came to a crisis in 36 hours, from the commencement, after which the redness diminished, until the eye was restored to its natural colour. The attack occupied generally from six to seven days.*

Section III.

Specific Inflammation of the Globe of the Eye.

In this section will be considered some remarks on specific inflammation of the globe, and on the malignant tumours of the eye.

1. *Specific inflammation of the globe.* Under this head I shall describe a disease very common in India, which from its destructive nature deserves careful attention, more particularly, as it has not been sufficiently attended to, and as it should be treated in a peculiar manner. Like other diseases of the globe the disease attacks some of the tissues of the

* Loc. Cit. p. 534.

eye more than others, and on this account the sloughing ulcer of the cornea has already been described under the head of symptomatic sloughing of the cornea, and I shall here confine myself to the complications produced by a peculiar state of the system which is not unfrequently the cause of the loss of sight.

The inflammation and suppuration terminating in sloughing of the cornea which was produced by dividing the nerves which supply the eye; and feeding animals on unazotized substances, or keeping them long fasting has the same effect on animals in producing the diseases of the eyes, as living on food which have imperfect nourishment and thus lowering the powers of life. The constant use of rice predisposes to these distressing ulcers of the cornea, which sometimes attacks whole ship's companies; and the lascars complain bitterly should rice be at any time substituted for biscuit; and the reason is that it makes them blind. But it is a curious fact that Bengal rice has not this effect; and is consequently preferred for long voyages, and sells at a higher price than the other kinds. This peculiarity is partly owing to the cheapness of food in Bengal, which enables the natives to use condiments along with it. Weak persons in this country, of the lower class, will be found to live on aliment possessing no diversity of ingredients, to reside in damp impure air, in close heated rooms, and exposed to sudden and great changes in temperature. When such patients are in this state exposed to fatigue, or mental depression, by which they are reduced to great dibility and apathy, the tongue becomes palid and tremulous, they have no appetite, bowels generally relaxed, extremities shrunk, and the surface of the body cold, without much cutaneous perspiration. The pulse is small,

soft, and frequent. The sides of the face, lips, and eyelids swell, and the inflammation of the conjunctiva is of a peculiar variety; being of a dark pinkish colour, and thickened. There is considerable pain, with the discharge of warm tears, and great intolerance of light, so that it is with considerable difficulty that the pupil can be seen. When observed it is of a whitish milky appearance, and the surface is found irregular and dull in appearance. In the acute form a small groove is found near the edge of the cornea, the iris is inflamed, and the anterior chamber filled with a muddy purulent fluid. The ulceration extends, penetrates the different layers of the cornea round its circumference, and the whole cornea sloughs, in the form of a yellowish pulpy substance. This being removed leaves the dark iris bulged out from the dark pinkish, and thickened conjunctiva, in consequence of the crystalline lens, reduced to an opaque whitish substance, being pressed forwards, and on its being evacuated the eyeball collapses. In some cases the other eye became diseased, followed the same course, and in like manner was quickly destroyed.

This disease of the eye is sometimes complicated with others, and with extreme emaciation when both eyes are more or less affected. In most cases after the loss of one eye the other gets well, and retains a certain degree of vision.

During the collapsed state of insamity, in which diarrhœa is often present, the eyes are often afflicted with this disease. I have already, under the head of amaurosis, given a short account of an epidemic in which the eyes were in many of the cases attacked with this cachectic inflammation. In other patients the disease was produced in the course of other dibilitating diseases, of which the following is an example.

Nujooh, æt. 30, was admitted into the hospital with phagidemic ulcers over the body. They appeared as indolent boils which burst, and terminated in ulcers. In this state of disease, and great weakness, his bowels became deranged, and the disease terminated in dysentery. His eyes became next very irritable, and the conjunctiva red, especially round the cornea. In examining the cornea it was found of a muddy white appearance, from the thickening, which was particularly white and opaque near the centre of each cornea. The usual treatment was employed in vain, and the patient sunk, reduced to a skeleton.

I carefully examined both eyes after death. In each there was a thickening, and milky whiteness of the conjunctiva covering the cornea, which could be torn, from the clear cornea underneath for two-thirds of the space from the circumference to the centre of the cornea. Near the centre, the milky-like appearance also increased, and in each eye a layer of purulent interlamellar matter had formed, softened, and terminated in an irregular ulcer externally, and at the point it had penetrated through the cornea. Had the person lived, this inflammation would have been followed by an extension of the ulceration, and eventually, in all probability, by the destruction of both eyes.

The treatment of this form of disease is difficult, and the result very uncertain, for while the system is to be supported by light nourishing food, and attention paid to the abdominal secretions and discharges, the local disease must be carefully attended to. The importance of the organ, which is in such a dangerous state, must be treated without reference to the general state of the system. In many cases the pain, intolerence of

light, inflammatory redness, and hot tears indicates the employment of leeches. I have often used with the best effects, blisters at a distance from the eye so as not to cause an œdematous swelling round that organ, and a careful attention to the state of the bowels. When this treatment has been followed, and the heat of the tears has been diminished, the spirit opii is to be dropped into the diseased eye.

2. *Malignant Tumors of the Eye.* These may be considered as arising with more or less local inflammation; and although they commence in one tissue of the eye more than another, all are involved in the disease in its course. I shall consider these under the heads of dropsy, simple fungous, fungous hæmatodes, cancer, and milanosis of the eye.

Hydrophthalmia, or Dropsy of the Eye.

This form of dropsy is supposed to depend on some inequality of the secreting and absorbing vessels. This explanation is not quite correct, as it would lead us to suppose that this disease resembled dropsy in other parts of the body. This however is not the case. The dropsy of the eyeball is produced by specific inflammation, and a morbid degeneration of the humours, which generally leads to the total loss of vision. It is therefore to be considered as a local disease, and a symptom of a morbid state of the system, which may be remedied by a proper course of remedies. This disease may be divided into two varieties, the one affecting the aqueous humour, the other the vitrious.

Dropsy of the Aqueous Humour.

This form of dropsy usually follows severe attacks of inflammation, involving the cornea. This increases considerably in size, the anterior chamber is much enlarged, and the iris be-

comes sluggish, and of a darker hue. The patient complains of a constriction of the globe, and by degress loses the power of vision. The cornea becomes more prominent, and gradually bulges out so as to form a larger segment of a smaller circle than the healthy cornea. As the prominence becomes more marked, the cornea becomes of a gray muddy appearance, while round its edge the transparency of the cornea remains. This diminishes, as the cornea becomes irritated by exposure to the air, and the opacity becomes more dense. This condition is very different from staphyloma, which rises in a pyramidal and often tuberculated shape, with more or less of a pearly appearance. When this takes place little can be done, but when the cornea is bulged out, of a muddy white appearance, with a transparent or semi-transparent margin, the case is not so desperate. In such cases the superabundant fluid may be drawn off, and this may be renewed daily so as to keep the cornea flaccid, and to enable it to return to its former condition. Another means of promoting this object is to remove a segment of the cornea so as to reduce its size.

Dropsy of the Vitrious Humour.

In this variety of dropsy the enlargement takes place from the posterior part of the eye. In some cases the sclerotic coat seems to be bulged out. This is in the more chronic form. The vitrious humour is converted into a thin, clear, limpid fluid, and the hyloid membrane appears to be absorbed. In the acute variety the dropsy followed inflammation of the internal membranes of the eye, more especially of the choroid coat. The intolerance of light is often very great, and the pain most agonizing. In one case I found an unfortunate individual resting with

his face on his pillow, moving the head and moaning from the agony which he suffered. He was at one time almost frantic, and in his agony tore off the leeches which had been applied. In this case the usual antiphlogistic means as leeches, blisters, purgatives, &c. with opium, mitigated the severity of the symptoms; but it was not until the system was affected with mercury, that the pain disappeared. During the acute attack the ball of the eye appeared to enlarge, and the cornea to protrude more than usual, and he had become short-sighted: still vision was pretty good. In this state he absconded from the hospital. He returned sometime after in a state of total blindness. The cornea was much protruded, and the lens dislocated, pushed forward, and filling up the pupil, which was very large. Indeed, the iris appeared as a narrow dark-coloured border round the lens. Had the disease been seen in an earlier stage than this the iris would have been found arched forward, and brought into contact with the cornea, so as almost to obstruct the anterior chamber. The pupil would have been found at first contracted, but as the disease advanced it relaxed, and the pupil became greatly distended. The patient first complains of short-sightedness, and then of confusion of vision, and the disease terminates in complete amaurosis.

The nature of this disease is so little known, and as it is probable that it is produced by very various causes, the *treatment* to be pursued must be to follow those general principles of procedure which should always guide the practitioner in all such cases of difficulty. As I do not consider that what is called dropsy of the eye is ever produced as symptomatic of a general hydropic state, it is not, I conceive, necessary or proper to employ the remedies usually employed in such a condition of

the body, unless this state is proved by other evident causes. In most cases the increase to the vitrious humour is caused by a local cause, most commonly of an inflammatory nature. In such cases bleeding, general and local, calomel and opium to affect quickly the system, aperient medicines, with digitalis, blisters, setons, and stimulating and mercurial frictions, and rusout over the eyebrow, &c. are to be immediately employed. To the eye, fomentations, the vapour of water with opium, and warm dry flannel rubbed over with camphor, or other such aromatic substances.

When the disease is far advanced and the tension severe, the vitrious humour may be punctured, and a portion of the humour evacuated. This may be repeated so as to keep the eyeball flaccid.

A secretion of fluid has been found by Mr. Ware, and Mr. Walker, between the choroid coat and retina, or between the sclerotica and choroid tissues.

2. *Simple Fungous of the Eye.*

After ophthalmia a fleshy substance may arise from the sclerotic coat, from the orbiculars ciliaris, or from the cornea. In other cases the tumour arises from the iris, and produces an absorption of the cornea. These tumours sometimes take the malignant appearance. They often gradually disappear, and this is hastened by the employment of local bleeding, and the other parts of the antiphlogistic regimen.

3. *Fungous Hæmatodes of the Eye.*

The malignant fungous usually occurs before the twelth year, although it is occasionally seen in all ages. At the commencement of the disease the pupil may be observed to exhibit

a deep-seated, light greenish metallic coloured appearance, at the back of the eye. This appears in the form of a tumour, upon the surface of which branches of the arteria-centralis retina may be seen ramifying. Vision becomes impaired, and then lost, and the iris becomes protruded and immovable. The cornea next appears distended; the conjunctiva and eye-lids become inflamed, vascular, and diseased. The cornea sloughs, and a discharge occurs followed by a fungous tumour. In other cases the sclerotic coat yields, and a purple livid tumour appears. This increases in size, becomes irregular, and of a dark red colour, and bleeds on the slightest touch. These tumours ulcerate, slough, and discharge a fœtid matter. During this time the health is affected. The patient becomes wasted in flesh, his countenance sallow, with impaired appetite and digestion. Hectic fever supervenes with want of rest, and different nervous affections appear before the death of the individual.

The only remedy known for this disease is its early extirpation, before there is a disposition in the constitution to reproduce the disease.

In such cases the operation to be performed is the extirpation of the eye, which is to be performed in the following manner:

When it is found necessary to extirpate the eye, the patient's regimen should for some days before be carefully regulated, and his bowels attended to, in order to prevent inflammation, which might become dangerous by extending to important contiguous parts. The patient should be placed in the recumbent position, with his head a little raised, supported upon a hard pillow, and exposed to a good light. Should the lids be contracted or the eye-ball enlarged, the lid should be divided at its external commissure

and turned back; an assistant is then to raise the upper lid, and having previously passed a ligature through the cornea, a sharp-pointed, narrow double-edged straight knife is to be plunged through the conjunctiva, which is to be cut through at its reflexion from the palpebræ from the temporal commissure of the lids so as to expose the anterior opening of the orbit. The oblique muscles are then to be cut through, and the diseased mass is to be detached from the socket, and the orbital contents thus insulated, are to be divided at their posterior attachments. This division is done on the external side, by a pair of strong curved scissors. The divided commissure of the lids are to be united by one or two sutures, the eyelids are to be brought together, and the orbit covered with a soft rag dipped in cold water, which is to be renewed as often as it becomes dry or warm. An anodyne should be given at night, and the patient should be kept in a cool, dark place, and live on spare diet, until all risk of inflammation extending to the brain is past. Hemorrhage rarely occurs in this operation, and when it does it is stopped by filling up the orbit with lint, or a small piece of firm spunge, which is only to be retained for twelve hours.

4. *Cancer of the Eye.*

This disease commences in the form of a warty tumour, which appears in the inner canthus, or from the appendages of the eye. It extends and invests the globe, and fills the orbit. After enveloping the eye the tumour extends to the palpebral lining, the lachrymal gland, the periostium of the bones forming the orbit, which at length become one mass of disease. The general health becomes more deranged, and the patient dies worn out with pain and hectic fever.

This disease is equally fatal with fungous hæmatodes. The only means of saving the patient's life being the extirpation of the eye, before the constitution is affected. The operation is to be performed in the same manner as described under the head of fungous hæmatodes.

5. *Melanosis of the Eye.*

This disease usually appears in persons after the middle period of life; and may appear in the appendages, or in the eye itself. In this case the person first notices his vision indistinct, and the pupil has a peculiar opaque appearance, succeeded by a sense of pain and fulness in and around the eye, which is followed by an attenuation of the cornea or sclerotica, and an appearance of a black irregular tumour shining through it. The cornea or sclerotica gives way, livid or a blackish fungous protrudes, which increases and ulcerates slowly, and does not generally bleed much. This disease is usually more rapid in its progress than cancer, and extends through the foramen opticum into the skull, and a melonoid tumour forms in the brain. At this time great pain is felt in the eye and head, constitutional irritation accompanies the sloughing of the morbid growth, and the patient becomes insensible and dies.

Melanosis invades at the same time different parts of the body, such as the contents of the head, thorax, and abdomen, the bones, skin, cellular tissue, &c.

On dissection in some cases the only part affected with the disease is found to be the internal surface of the choroid coat, which is of a grayish brown colour, firm and very vascular The retina and corpus vitreum are converted into a semifluid brownish substance, the lens is slightly opaque, the iris has a

dirty blue colour, and the cornea is in a normal state, but pushed somewhat downwards. In other cases the disease seemed to have advanced further; and all traces of the retina, corpus vitreum, lens, and iris were gone, and nothing but a brownish black substance penetrated with numerous tough fibres was to be seen; the part of the tumour which had pushed through the cornea, fell off, and when put into water soon dissolved, imparting a brownish black colour to the water.

CHAPTER V.

Consequences of Inflammation, and other diseases of the External Tunics of the Eye.

In this chapter will be considered the consequence of previous inflammation; as closing the pupil, staphyloma, yielding of the sclerotic coat, conical cornea, by which vision is more or less affected.

SECTION I.

Closure of the Pupil, and Operation for Artificial Pupil.

The inflammation of the iris quickly passes to the second stage of effusion of coagulable lymph, by which the action of the iris is impeded, and often entirely destroyed; by the adhesions which it forms with the capsule of the lens, and by the

pupil being closed, and filled up by the deposit of lymph. In this condition the following states of the eye will require the performance of an operation for artificial pupil.

1*st*. When the person is blind in both eyes from contracted, or closed pupil.

2*d*. When an indelible opacity covers the pupil.

3*d*. When the pupil is obliterated, from the contraction of the iris, and the effusion of coagulable lymph; which fills up the pupil, and unites the iris to the capsule of the lens.

4*th*. A prolapsis of the iris through a breach in the cornea, which involves the pupillary margin. These and other modifications destroy vision, and have induced surgeons to propose various operations for the formation of an artificial pupil. The principal varieties of these operations are the following: each of which will, under certain circumstances, be superior to the others, the selection therefore must be left to the experience and judgment of the surgeon.

1. *Operation*. When the iris is tense, the cornea clear, and the crystalline lens removed from the line of vision, introduce the small knife, for making the artificial pupil, through the sclerotic coat, a line for the cornea, and another under the transverse diameter of the eye. The knife should have its flat side turned upwards, and its cutting edge backwards. The point of this knife is to be curved forward so as to penetrate through the iris —conveyed along the anterior chamber, and with a cutting or sawing motion the iris is to be divided to a sufficient extent for the purpose intended. This operation may be performed when the crystalline has beenoved, and rem is the most frequent operation required to be performed in this country; the cause of the close of the pupil being usually inflammation of the inter-

nal tunics, with effusion of coagulable lymph in the pupil. Marginal adhesion takes place between the iris and the capsule of the lens, and the person's eyesight is permanently lost; or old and neglected ulcers of the cornea followed by prolapse of the iris, and such an extent of opacity of the cornea as to abstruct vision. In such cases I prefer the following modified operation:— I introduce a sharp spear-pointed needle in the usual manner through the sclerotic coat; pass it through the iris into the anterior chamber of the aqueous humour, and with a sawing motion I divide the iris to the required length; should the wound expose a cataract or an opaque capsule, it is to be depressed as the knife is withdrawn.

2*d*. *Operation* is the excission of a portion of the iris. For this purpose the cornea is punctured, the eye-ball gently pressed upon, or a hook is to be introduced and a portion of the iris is to be drawn through the wound, and the protruded part slipped off with a pair of scissors.

This operation should be performed when a portion of its circumference is transparent, opposite which the artificial pupil should be made. In such cases care should be taken to see that the lens and its capsule is sound and are not wounded. A modification of this operation may be followed with advantage; when the clear part of the cornea is small make an opening in the cornea, divide a small portion of the iris by means of the iris-knife, introduce the hook, and tear a portion of the iris large enough for forming the pupil.

3*d Operation*. Another method is to separate a portion of the outer margin of the iris from the corpus ciliari. It has also been found useful to cut away a portion of the iris; or strangulate the iris, when separated in the wound of the cornea.

This operation may be performed when only a small portion of the cornea near the circumference is transparent.

4th Operation. Another operation for artificial pupil is performed by dividing the cornea near its juncture with the sclerotic coat with a cornea-knife, to the extent of one-fourth of its circumference. Into this wound the points of a pair of fine scissors, are to be introduced with the flat side upon the wound. Their points are then to be opened, the sharp point introduced under the iris, and a portion of the iris divided so as to leave a triangular or quadrangular opening, which retracts and thus leaves a good pupil. This is one of the most favourable methods of operating, when the lens and its capsule are transparent; care should be taken in performing these operations that the assistant has a firm hold of the head of the patient upon his breast, when it rests upon the raised back of the chair, so as to prevent his starting. I have seen the neglect of this precaution cause the loss of the eye, by the scissors being plunged deep into the eye, and dragging out the whole iris, as the person threw back his body.

Another disadvantage of the last operation is in the weak and old, in whom the wound in the cornea does not heal. I have known it remain for days open with the acqueous humour distilling continually from it. In this case some calomel powder is to be blown into the eye, which is quickly followed by the necessary degree of adhesive inflammation.

The operation for artificial pupil should not be performed when the person sees with the other eye; unless under very peculiar circumstances, and when neither eye is inflamed.

Care should be taken not to wound the opacities of the cornea, as they are often followed by most distressing inflammation of

the eye, which is so difficult to cure, as sometimes to endanger the life of the individuals. In all such cases the incision should be confined to the transparent part of the cornea. It is also of importance to recollect that the iris will generally, in such cases, be removed from its natural position, and be attached more or less to the neighbouring parts.

2*d*. The state of the eye-ball. The operation for artificial pupil should not be performed when the eye-ball is in a state of atrophy, or is flaccid and soft, or when it is preternaturally hard, with an appearance of tumours, or of dropsy.

3*d*. The state of the iris, which will sometimes counter-indicate an operation for artificial pupil.

After the operation for artificial pupil has been performed, the patient should be removed to a dark room, and an anodyne draft given, with cold applications to the eye. His diet should be strictly antiphlogistic. Belladonna, with camphor, should be applied round the eye, except for the operation in which the iris has been separated from its ciliary attachment, when a short time should be allowed to pass before it is applied; should there be any pain in the eye or round the orbit, in the evening; leeches, or even venesection may be necessary, with a dose of calomel with opium and henbane. This may require to be repeated so as to affect the mouth. Purgatives should be given in the morning as required, and after the inflammation has been subdued tonics with nourishing diet will be necessary.

Section II.

Staphyloma.

This disease has received its name from the supposed resemblane to a grape, and is intended to designate an affection in

which some part of the eye-ball is protruded beyond its natural position. There are two varieties of the disease, viz. Staphyloma sclerotica, S. cornea, and S. racemosum. The influence of climate upon the character of individuals extends itself to the diseases they are subject to. Every climate has its peculiar classes of diseases and symptoms, which are in a more or less marked form; and require modifications in the manner of treating them. These peculiarities are very evident in diseases of the eye, of which the following remarks are intended to afford an example.

Staphyloma corneæ is that disease in which the part loses its natural appearance, is elevated and gradually projects beyond the eye-lids in the form of an oblong tumour. Staphyloma of the sclerotic and choroid coats are names given to tumours in which the sclerotic coat is bulged out, or becomes so weakened as to admit the protrusion of the parts underneath; by which the eye not unfrequently is destroyed. As these diseases are altogether different in their nature from staphyloma of the cornea, it has been proposed to call it yielding of the sclerotic coat. I shall now add a few remarks on each of these forms of disease.

a. *Yielding of the sclerotic coat.*

This disease is of common occurrence in this country, and not unfrequently leads to the destruction of the organ; from the relaxed and weakened fibre of the native of Bengal, extending to the sclerotic coat, which gives figure and strength to the globe of the eye, and separates the external from the internal and more delicate parts of the eye. This natural weakness of the sclerotica is frequently increased by the eye becoming inflamed, which is generally of a rheumatic nature.

The part of the sclerotic coat which most frequently yields, is near its junction with the cornea, where the sclerotica is little more than half the thickness of its posterior part, and at those parts where the tendons of the recti muscles of the globe are less firmly fixed. At these intervals the sclerotic is thicker than where the tendons are inserted, which gives the dark bluish tinge at these parts, an irregular and sacculated appearance. These swellings are often found encircling the cornea.

A second form of yielding of the sclerotica is when the swelling is diffused over a large portion of the ball, behind the insertion of the muscles. This variety generally occurs in dropsy of the eye.

A third kind is more rare, and is only discovered after death. It is situated near the juncture of the optic nerve with the sclerotic coat.

The unyielding nature of the sclerotic coat supports the internal parts of the eye, and it is only by a slow interstitial absorption or morbid change in the structure of the sclerotic coat that the internal parts appear. This cause may be the inflammation produced in the progress of amaurosis; but much more frequent causes are attacks of rheumatism, ophthalmia, particularly when it is accompanied, in this country, by the abuse of mercury. These causes weaken the sclerotic coat, which becomes thinner; and the black choroid coat appears in dark irregular patches, generally but little elevated above the surface of the sclerotic coat. In this state it may remain stationary for a considerable period. In some cases the swelling is prominent, and may increase in size and affect vision; in other cases the iris is dragged to one side, and the conjunctiva round the cornea is in a state of chemosis with the complete extinction of vision.

Case. Pearee, aged 36, was admitted into hospital on account of an extensive yielding of the sclerotic coat of the upper and outer part of the right eye. This swelling appeared seven months ago, after an attack of rheumatism, for which she took mercury. This was followed by inflammation, ten days after which the swelling was first observed. The swelling was the size of a large bean, partly of a blue colour, with considerable redness and chemosis surrounding the cornea. The cornea was pretty clear, but the pupil was of an oblong form, from its being dragged towards the tumour, which contained a portion of it. The swelling suppurated, and a large core formed within it, which was slowly separated. Aperients, counter-irritants, alum solution, the nitrate of silver, and poultices were employed, with anodynes, when the pain was severe. The cornea became slowly opaque, and the eye was destroyed.

Case. Haru, aged 25, had been subject to rheumatism, for which he took mercury at the recommendation of a native quack. His system was affected. In this state his eye became inflamed and four months ago he noticed a small swelling in the eye, which has been gradually increasing, with pain and surrounding inflammation. It is now the size of a large pea, and as prominent as to give a peculiar appearance to the lower lid, and it is somewhat narrow where it appears to spring from the sclerotic coat. After an aperient, the surface of the swelling was freely touched with the nitrate of mercury, to promote a more healthy inflammation, so as to strengthen the weak part, and to reduce the size of the tumour. This produced no favourable effect, and the tumour was snibbed off by a pair of scissars, which exposed the small opening in the sclerotica. The nitrate of silver was again applied, but soon after the

tumour began to form, and it became as large as before.—(See plate I. figs. 5, 6, & 7.)

2. *Staphyloma Corneæ.*

This disease is produced by the morbid state of the cornea to which the iris adheres; and follows severe attacks of purulent ophthalmia, and other inflammatory diseases. It is characterized by an elongation of the cornea, which becomes opaque, of a white pearly colour, and dense consistence. This tumour often projects beyond the eyelids, and sometimes smaller tumours form on its side. In general it is smooth, and is usually accompanied with total blindness.

In the one case the staphyloma appears to be produced by the bulging of the cornea, from its being weakened, and having lost its due resistance at that part, with the morbid state of the aqueous humour. The second kind the staphyloma is circumscribed, from the cornea yielding at one or more points to the pressure from behind, when the tumour is subdivided into small portions by more or less deep fissures, so as to admit of its being compared to a bunch of small grapes, when it is called S. *Racemosum.*

In these cases the lamellæ become thickened, in the same manner as the aneurismal sac become thickened; and from their exposed situation and continual state of irritation the most prominent parts become dense, opaque, and at last of a pearly whiteness, from the gradual condensation of the lamellæ of the cornea.

This is one of the most distressing diseases to which the eye is subject, as it causes the total loss of sight. The treatment is either palliative, or radical: the first consisting in removing

inflammation, and guarding the eye against all sources of irritation. The aqueous humour may be occasionally evacuated, and the solution of the nitrate of silver applied to the morbid inlargement. The radical treatment is required to prevent the distress occasioned by the continual inflammation to which it is subject; for this purpose the anterior part of the cornea is removed. In performing this operation the cornea is kept steady by a tentaculum or hook, with which the prominent part has been transfixed, and its apex is divided by a cornea knife. The crystalline lens and the aqueous and vitrious humours escape, and the eye collapses, so as to admit the use of an artificial eye, when the wound has been healed. The disease is very common in this country, and often affects both eyes, producing irremediable blindness. But, by that benevolent instinct which is so natural to the human heart, the blind are the objects of care, and of the bounty of the charitable; the milk and the rice, and the cowries are cheerfully given: and they are carressed, and entertained to bring good luck to the house, or as a source of gain.

Section III.

Conical Cornea.

This disease appears to be produced by a conginital weakness, or severe inflammation of the cornea, which becomes thin from the absorption of its interlamellar texture, and protrudes by the pressure from behind; and becomes of the form of an obtuse cone, the apex corresponding to the centre of the cornea. No inflammation, pain, or change of structure of the part occurs.

The first symptom noticed by the patient is his becoming very near-sighted, and the cornea having a peculiarly dazzling appearance. The artificial helps produced by glasses, and a pupillary apperture in a black ring frame, with repeated blisters and the most powerful tonics, with cold bathing, will be of slight temporary use, and is all that can be promised to the patient.

Case. John Newton, æt. 25, belonging to the band of the artillery. He had a severe attack of remittent fever last year with great determination to the head. It was accompanied with a severe attack of ophthalmia, which commenced in the right eye, and subsequently attacked the left. He recovered from the fever, but his vision remained impaired; and has lately become so much worse that he could not read music, and was discharged in consequence from the band.

The corneæ of both eyes are now elevated in the centre to a conical point, so as no longer to form the segment of a sphere, applied to the sclerotic, but a pointed cone. When the cornea was viewed sideways it appeared transparent of a conical shape, with the apex rather less transparent than the ball. This was particularly evident in portions of the corneæ, where slight white opacities appeared; which however did not present any considerable obstacle to vision.

When the eye was placed directly opposite a window, the apex of the cone reflected a strong light as of a luminous point, and near the apex of the right eye a whitish nebulous opacity was seen with several large vessels passing over the cornea. The left eye was more transparent. Tonics were recommended internally with nourishing diet, leeches near the eye, the frequent application of blisters behind the ears, the evacuation of

the aqueous humour, and dropping a solution of the nitrate of silver, with bathing in cold water. The disease was produced in this case by a debility of the parietes of the corneæ, and an unusual secretion in the anterior chambers of the eyes. (See Plate I. fig. 4.)

CHAPTER VI.

Diseases of the appendages of the Eye.

These diseases will include those of the eyelids, of the lachrymal passages, and of strabismus.

Section I.

The diseases of the eyelids, are inflammatory swellings, consisting of incysted tumours, Trichiasis, Entropium, Ectropium, and Ptosis.

1. *Stye, or Hordeolum.*

These consist of small inflammatory tumours in the margin of the lid, which are supposed to resemble barleycorns. These swellings are produced by an obstruction in the follicles of Meibomius, which are situated in the ciliary margin of the lid. The contents of these follicles become inspissated, and suppurate. The best application to styes in their primary state are gently stimulating ointments, such as the zinc, the diluted cetrine, or the red precipitate ointments. These act as gentle stimulants, and dissipate the inflammation. When the

stye is large and inflamed a leech, or cold applications, may be applied, or if the inflammation has advanced too far, fomentations and poultices will hasten its maturity. When the stye suppurates it may be opened with a lancet, and the part afterwards bathed with a slight astringent wash.

In such severe cases gentle aperients should be administered, and attention to diet observed; as such local inflammations are indications of a certain degree of derangement of the stomach and bowels.

2. *Tumours.*

The tumours of the eyelids are superficial or tegumentary, and deep-seated, or tarsal tumours. The superficial tumours are situated in the cellular tissue, connecting the integuments with the orbicular muscle; and when of a stiatomatous nature sometimes acquire the size of a pigeon's egg. They should be carefully dissected out. The *Tarsal Tumours* are less prominent than the last, and appear through the tarsus. They should be removed by everting the lid, and then opening the tumour, by a crucial incision and snipping off the appices of the angles with a pair of scissars, to prevent the wound closing too soon. It is often necessary to break down the contents of the swelling, from which a small fungous sometimes projects some days after. This is cut off, and the part heals.

3. *Trichiasis.*

This consists in a morbid growth of one or more of the eyelashes in consequence of which they are turned inwards against the eyeball, and irritate the conjunctiva and cornea by their

continual moving over it. This morbid state of the eyelashes may be produced by inflammation, and swelling of the eyelids. It is often succeeded by an unusual relaxation of the parts, producing Entropium, or inversion of the lids; and is sometimes followed by an unusual shape of the cartilage of the eyelids.

The treatment of Trichiasis is either palliative or radical. The first consists of drawing away, and turning outwards the eyelids, by means of adhesive plaster fastened to the lid, and to the neighbouring cheek, or forehead. Before this is done the inverted hairs should be pulled out with a pair of broad pointed forceps. This is best done by seizing the hair near its root, and drawing it directly outwards.

The radical cure of this distressing complaint is accomplished by extirpating the roots of the inverted cilia. Two operations are recommended for this purpose—the one being to separate the cartilage as well as the integuments; the other consists in saving the cartilage. I prefer the latter operation, for two important reasons. To diminish the deformity, and to save the meibomian glands; by which the eyeball is kept moist and clear. However, it is very rare that the radical operation is required, as the palliative operation is generally sufficient; and when an operation is required that for Entropium will be sufficient.

4. *Entropium.*

The inversion of the eyelid is produced by the relaxation of the skin of the lids after ophthalmia, &c. or by the healing of ulcers of the tarsi, by which the eyelashes are turned inwards. By their continual friction upon the cornea they cause great irritation of the conjunctiva and cornea. The usual symptoms

of chronic ophthalmia supervenes. The cornea becomes nebulous; vessels appear upon its surface, and irregular superficial ulcerations, with opacity supervene. As the causes of Entropium usually affect both eyes, so both the corneæ become diseased, and a total loss of sight is often the consequence in this country. I have seen cases in which this disease appeared to be hereditary. Several methods have been proposed for the removal of this distressing complaint. One method consists in applying the concentrated sulphuric acid, with a small bit of smooth hard pointed wood, dipped in the acid, and drawn gently and repeatedly over the surface of the skin, along the length of the relaxed lid a quarter of an inch from its edge. The greatest care requires to be taken in performing the operation to prevent the contact of the acid with the ciliary margin, or the globe. The cicatrix of the cautarized part retracts, and the lid is everted. A much more effectual, and not more painful method consists in removing an oval-shaped portion of the skin and cellular membrane, from the relaxed lid, and then bringing the edges of the wound together by two or three sutors, and applying stripes of adhesive plaster from the edge of the lid to the forehead. In performing the operation the skin is to be raised by means of a pair of forceps with transverse branches, and the portion of skin thus raised is to be removed by means of a pair of scissars. In many cases this operation is found not sufficient, and after a temporary period of relief, the disease returns with the same consequences. There are other operations which may thus be performed: one is to divide perpendicularly the cilia near the external canthus, and again immediately external to the puncture with a pair of scissars. These incissions should be half an inch deep; and the lid is to be

turned backward and secured in that situation. As the cicatrix heals the lid is allowed to return to its natural situation. A more effectual operation is to transfix the lid near its middle with a hook, and pass a cornea knife through the lid a quarter of an inch from its centre, and remove the diseased part, or in the severe cases of the disease, as seen so often in this country, the whole margin first on one side and then on the other, diminishing the breadth of the part to be separated near its two extremities. By removing the margin of the lid, when diseased, you remove the hairs with their roots and leave the soft skin, which adheres to the edge of the cartilage. By diminishing the breadth of the margin at both extremities you do not interfere with the ducts of the lachrymal glands nor with the lachrymal puncture. The operation may be modified by making an oblique incision through the margin of the lid which is to be dissected off along the lid, taking care that all the roots of the inverted hairs are removed. This operation is more tedious than the last, but it has the great advantage of leaving the ciliary cartilage whole, by which the appearance of the eye will be less disfigured, and the glands saved.
seen not unfrequently among the natives of this country.

Mr. Tyrrell recommends a perpendicular section of the whole substances of the lid, near its centre, which in some cases is followed by a rapid removal of the inversion, while in other instances it is necessary in addition to cut out a portion of the integuments. The section of the lid makes a wound shaped like the letter V, which is afterwards filled by granulations, so that little deformity exists. Mr. Tyrrell has found this method invariably successful.*

* Vol. I. page 447.

In some of these patients I found that after the chronic inflammation of the lids has remained some time, the obliteration of the ducts of the lachrymal conjunctival glands takes place, and no tears are secreted. The meibomian glands in like manner participate, and the conjunctiva is no longer kept moist, but becomes dry, rugous, and opaque; vision becomes slowly lost, and the eye sinks. This is the *Xeroma*, or dryness of the eye of Authors. It is of frequent occurrence in this country, where the relaxation of the climate, the indifference and ignorance of the inhabitants induce them to follow their usual occupations in the open air, as long as they can see. Their patience and resignation under what they consider as inevitable evils prevents them often, for long periods, endeavouring to obtain relief. In some of the cases that have applied for relief, the persons were quite blind from the thickened, dry and opaque conjunctiva, produced by the local inflammation kept up by the friction of the hairs. This disease deserves more attention than it has received, and it is an argument against removing the ciliary cartilage, and glands in cases of Entropium, when the bulbs of the inverted cilia are extirpated. In such severe cases I have found hot water, and the application of stimulants locally, of much use.

5. *Ectropium.*

Eversion of the lids is produced from cicatrices, and contraction of the skin of the lids; by ulceration, by inflammation of the follicles of meibomius, and by great swelling of the conjunctiva in the course of severe ophthalmia, especially of the purulent kind. It usually affect the lower lids.

As the eye is not properly covered, distressing irritation is

produced by foreign bodies getting into it, which keep up the state of inflammation.

If the swelling is produced by a morbed thickening of the conjunctiva, it should be treated by the application of the red precipitate ointment, which may be freely applied to the thickened surface, and will reduce the morbid growth, and rectify the secretion of the tarsal glands. But when the inflammation involves the whole lid a triangular portion is to be removed, the base of which must be towards the margin of the lid. The edges of the wound are to be brought together by a suture, and a piece of adhesive plaster.

6. *Ptosis.*

This is the falling down of the upper eyelid, and the more or less inability to raise it; which may be produced from a congenital imperfection, from mechanical causes, from weakness, as I have seen after purulent ophthalmia, or from paralysis. This may be hemaplegia, or it may be caused by a paralysis of the levater muscle, or a determination of blood to the head. In one case a middle-aged man had Ptosis brought on after ophthalmia, caused by a foreign body falling into the left eye. The right eyelid became affected in the same manner, followed by paralysis, and an edematous state of the lid.

The opposite nature of the causes of Ptosis will render it necessary to vary the treatment. In general the abstraction of blood, aperients, low diet, and the administration of mercury, will be found necessary. Counter-irritants will likewise be of great use; such as blisters to the nape of the neck, behind the ears, or on the temples or forehead; tartar emetic ointment, or setons. In some cases the disease is very obstinate from the severity of the cause which produced it.

Case. Ptosis, with amaurosis of the left eye. Hurry Jogee, æt. 30, of a spare habit of body, but otherwise in good health. Admitted into hospital May 22, 1842. He states that the disease commenced a month ago, with headache, and he soon lost completely the sight of the eye. The left upper eyelid was edematous; and hung down over the other. On raising the lid the ball appeared more prominent than the opposite one, and the pupil was much enlarged, and immovable.

The patient had a blister applied to the temple of the left side, with calomel and opium twice a day, andcalomel and jalap as a purgative.

25th. Mouth sore, pain diminished, and the pupil contracted on exposure to light; bowels open. The conjunctiva much swollen, and loaded with lymph.

26th. The pain returned very severe in the head, and eye. The calomel and opium was stopped, and the pupil became diminished in size, and not larger than the right pupil. The swelling likewise diminished. As the cure did not appear to advance, the mercury was not pushed further and strychnine in doses of $\frac{1}{8}$ of a grain was exhibited twice a day.

June 4th. Has complained of pain in the temples, head, and eye, which was diminished and alternately removed by a blister, kept open by means of Sabine Cerate. On the 13th the pain was much diminished, and the iris contracted. From this time the cure went on favourably.

Section II.

Diseases of the Lachrymal Passages.

The lachrymal organ and passages, which secrete and excrete the tears, consist of the lachrymal gland, and its secretary ducts;

the lachrymal puncta, and passages; and the lachrymal sac, and nasal ducts. The conjunctiva above, and the mucous membrane of the nose, are continuous with the lining membrane of these passages. The lachrymal, a conglomerate gland, and situated under the external extremity of the superorbitary ridge, from which six or seven very small canals arise, and open in the inner face of each upper lid, near the external angle of the eye. The tears are thus spread over the surface of the eye, while the superfluous tears are conveyed to the nose, through the lachrymal puncta to the lachrymal passages, and lachrymal sac, and terminate in the nasal duct. In its course downwards the diameter of the duct gradually diminishes, and it opens into the anterior part of the lower meates of the nasal fossa by one opening, which is oblique from above downward, and from within outward.

These organs and passages are subject to different diseases. The lachrymal gland may secret tears so copiously that they cannot be led into the nose in sufficient quantities, or the canals may be closed, and a portion of the tears flow over the lower lid. This is called *Epiphora;* the defective excretion is called *Stillicidium Lachrymarum;* another disease of these passages is inflammation of the lachrymal sac; and stricture of the nasal duct.

1*st*. *Epiphora* may be produced by an increased secretion of tears, from exposure to sudden changes in temperature, by the application of acrid fumes, or by the admission of extraneous bodies into the eye. The conjunctiva in that part of the eye is usually inflamed by the tears being of a more stimulating quality than natural, and the irritation extending to the nasal sac and duct, is accompanied with a feverish state. This is

the affection called *Coryza*, which increases for three days and then declines.

The cause of the disease is to be removed, aperients administered, and astringent collyria employed, with a little of the cetrine ointment applied to the edges of the lids.

2*nd*. Another variety of Epiphora is produced by a closure, or constriction of the puncta, or obstruction of the lachrymal ducts. This disease is called the *Stillicidium Lachrymarum*, and causes a troublesome watering of the eye, which is increased by any cause augmenting the flow of tears, such as exposure to cold air, to the sun, and exercising the eye in reading, writing, or the like. In such cases a small probe is introduced to enlarge the ducts and passed into the sac. This may be repeated as often as it may be considered necessary. If the puncta be obliterated they may be opened; but the disease is incurable when the ducts are obliterated.

3*rd*. *Inflammation of the Lachrymal Sac.*

In scrofulous and unhealthy subjects, the sac becomes distended with mucus, either from an increased and modified secretion, which stops the nasal duct, or from the contraction of this from chronic inflammation. The swelling of the inner canthus is often in such cases so slight, as not to be noticed until the person's attention is drawn to it from the eye watering on being much used, or on being exposed to any considerable change in temperature. Pressure upon the tumour, so as to empty the sac, removes for a time the inconvenience; which is often little attended to. At a more or less advanced period the person finds that he cannot empty the sac as usual; the swelling under the inner canthus increases and becomes red, hot, and

painful. This state is produced by a suppuration of the sac, which points, ulcerates, and a quantity of pus is evacuated with immediate relief. This constitutes the true fistula lachrymales. Sometimes the inflammation of the sac is more acute, and is accompanied with pain in the corner of the eye, shooting to the eyeball. The swelling is red and painful, and sometimes extends to the head, and the neighbouring cellular tissue, with a suffusion of the conjunctiva, a swelling of the eyelids, and a copious secretion of tears. There is often a considerable degree of fever, and the nasal canal becomes closed, preventing the passage of the tears into the nose.

In the *treatment*, the first object is to remove the inflammation by leeches. In some rare cases general blood-letting is even required, with cold evaporating lotions. When suppuration has taken place emollient fomentations and poultices are to be used, followed by cold lotions. A free opening is to be made into the sac, and its contents are to be evacuated. When the inflammatory disturbance has entirely subsided, a probe is to be passed along the duct into the nose. If the obstruction of the ducts continues, the sac is to be emptied every day, and an astringent wash used.

When the nasal duct is permanently and completely closed, the passage between the sac and the nose must be re-established, and retained open. The following methods have been recommended to accomplish this object:—

a. Syringing through the puncta.

b. A seton passed through the puncta into the nose.

c. Injecting fluids into the sac from above, and from below.

d. The introduction of tents into the nasal duct.

e. The introduction of a nail-headed style. This last is the

plan usually followed. For this purpose the eyelids are to be drawn outward, so as to stretch the orbicularis palpetrarum muscle, and a puncture is to be made into the sac under the tendon of the muscle, by means of a sharp-pointed bistoury. The contents of the sac are to be discharged, and a probe is to be passed into the nasal duct into the nostril to remove the obstruction. Tepid water is to be injected to clean the duct, and the style is to be introduced sufficiently far that the head may rest in contact with the skin and its lower extremity, to the termination of the nasal duct in the nose. The style should be cleaned daily for the first week after the operation.

Section III.

Strabismus.

This distortion of the eye is produced by a loss of parallelism of the two eyes; from the strongest of the two eyes, being used by the individuals in regarding objects, and by the aductor or abductor muscle of the eye acting more powerfully than the antagonist muscle. One of the muscles acts strongly, and draws the eye to one side; while the other antagonist muscle remains relaxed, and inactive. Sometimes we find that there is a disparity between the portions of the two eyes, and double vision is the consequence. Gastric irritation, teething, affections of the head, amaurosis, or weakness of one eye, and partial opacity of the cornea, may produce this disease.

In the treatment we must endeavour to remove the cause of the complaint; by curing irritation of the bowels, and binding up the weak eye. In some cases no cause can be assigned. In

old inveterate cases, when other remedies are found ineffectual, an operation is required. This consists in dividing the muscle that is acting too powerfully, so as to restore the eye to the natural position, and the axis of vision to a state of parallelism.

The following are the instruments required for the division of the muscle :—

1. A small toothed forceps.
2. A pair of small narrow straight blunt-pointed scissars.
3. A blunt hook with the bent part half an inch long.
4. A small sharp hook, to draw the eyeball outward: and
5. A small piece of sponge, with cold water.

If an adult, the patient should be placed on the chair used for performing the operation for cataract, with his head steadied by an assistant. If a child, the patient is to be wrapt in a sheet, so that his arms and legs are kept at rest; and placed on a table with his head resting on a hard pillow.

Operation.—The opposite eye having been covered with a compress and roller, the assistant supporting the head with his left hand, placed under his chin, raises the upper eyelid with the fore-finger of his right hand. By a second assistant the lower lid is to be depressed, by fixing a spring artery forceps in the fold of the conjunctiva between the lid and the globe towards the inner angle, and allowing it to hang down. The operator, standing in front, directs the patient to turn his eye as much as he can, in the direction which puts on the stretch the muscle about to be divided. The operator inserts the sharp hook into the tunica tendinea, opposite the part to be cut, and not deeper than the surface of the sclerotica. With this hook the eye is drawn outward, and the second assistant takes the hook

and keeps it in this position. The operator seizes the conjunctiva midway between the edge of the cornea and the caruncula lachrymalis; and raises it in a horizontal fold. He next snips vertically this fold, with the scissors along with the subjacent cellular substance, and enlarges the incision, so that it should be half an inch in length. The operator next insinuates the point of the blunt hook, under the lower edge of the muscles to be divided, and passes it up between the tendon, and sclerotica, until its point appears above the upper edge of the tendon, when it is to pass out. The operator then takes the blunt hook in his left hand, and draws outwards the muscle and divides the tendon from below upwards, and nearer the fleshy part of the muscle, than where its tendon is over the hook. The wound must next be carefully examined, and any portion of the tendon that remains should be raised by means of the blunt hook, and divided.

If re-action take place the usual means should be used to repress this; but as this is rarely the case the opposite eye should be tied up, and the patient should use the one operated on, and turn it frequently in the direction opposite to the former distortion. The wound should be fomented with warm water, and a decoction of poppy-heads two or three times during the day, and an aperient administered.

FINIS.

FORMULARY OF PRESCRIPTIONS.

1. *Emplastrum Tartari Emetici.*

R. Pulv. Ant. Pot: Tartar ℈ij.
Ungt. Cetacei ʒiv. *M.*

Spread thickly upon a piece of lint, of the size of a shilling. This is to be confined by a portion of adhesive plaster to the part to be irritated: and it should not be disturbed until the person feels some decided irritation in the part, which may require three or four days.

2. *Guttæ Argenti Nitratis.*

R. Argenti Nitratis, gr. ij.
Aquæ Distill. ℥j. *M.*

3. *Guttæ Spirit. Opii.*

R. Tinct: Opii ʒij.
Alcohol: ℥ij.
Aquæ Distill. ℥viij. *M.*
Of this mixture take ʒiij.
Aquæ Distill. ʒij. *M.*

One drop is to be let fall into the internal canthus of the eye.

4. *Guttæ Hydrargyri Bichloridi.*

R. Hydrarg. Bichloridi. gr. ss.
Aquæ distill. ℥j. *M.*

R. Hyd. Bichloridi. gr. j.
Ammoniæ Hydrochloras, gr. vj.
Vin. Belladonnæ, ʒij.
Aquæ distill. ℥viij. *M.* fiat collyrium.

5. *Haustus Anodynus.*

R. Spt. Æth. nit. ʒj.
Tinct. Camphor. Comp. ʒij.
Aquæ ℥j. *M.*

6. *Haustus Tonicus.*

R. Infus: Cherettæ,
Decoct. Cinchonæ, āā ℥j.
Carbon. Ammoniæ, gr. v. *M.*
Capiat ter die.

7. *Linimentum Ammoniæ.*

R. Liq. Ammoniæ fortis, ʒij.
Ol: Amygdalæ, ʒss.
Adipis recentis, ʒvss. *M.*

Sig. Smear a small portion over the eyebrows, by means of an ivory paper-knife, and allow it to remain on for ' alf a minute, or until it produce a smarting or heat in the part, when it is to be washed off.

8. *Lotio Saturni.*

R. Plumbi. Superacet. ʒss.
Aquæ Oj. *M.*

9. *Lotio Aluminis.*

R. Pulv: Aluminis, gr. iv.
Aquæ ℥j. *M.* et cola.

10. *Lotio Zinici.*

R. Zinic Oxyd. ʒij.
Aquæ ℥viii. *Misce.*

11. *Liquor Plumbi L. P.*

R. Plumbi Oxydi ℔ij.
Acid Acetic: Congium. *M.*

Boil down to ℥xi. constantly stirring; and after the impurities have subsided, strain.

12. *Lotior Opii Sedativi.*

R. Solutio Opii Sedativi ʒij.
Aquæ distill. Oj. *M.*

10. *Mistura Sedativa.*

R. Alum. Sulph. gr. x.
Opii, gr. v.
Aquæ q. s. et adde Ext. Amomum Anthorrhizum u-
sout) gr. x. *M.*
Apply upon the eyelids twice a day.

14. *Unguentum Belladonnæ.*

R. Ext. Belladonnæ, ʒss.
Unguent. Camphoræ, ʒiv. *M.*
To be applied round the eye, to dilate the pupil.

15. *Unguentum Cetacei L. P.*

R. Cetacei, ʒvj.
Ceræ albæ, ʒij.
Olivæ Olei, ℥iij. ft. Ungt.

16. *Unguentum Nitratis Argenti.*

R. Nitr. Argenti, gr. x.
Ungt. Cetacei, ʒi. *M.*

17. *Unguentum Hyd. Nitrat. Dilut.*

R. Ungt. Hyd. Nitrat. ʒj.
Ungt. Cetacei, ʒvi. *M.*

18. *Ungt. Hydrarg. Oxyd. Nitrat. Dilut.*

R. Hyd. Nitrico-Oxydi, ℥j.
Ceræ Albæ, ℥ij.
Adipis preparatæ, ℥vj.
Add the Oxyd reduced to a fine powder, to the melted fat and cerate.

19. *Vinum Opii* (L. P.)

R. Extract Opii, ℥j.
Cinnam. Cort. Cont.
Caryophylli Cont. āā. ʒj.
Vini Oj. *M.*